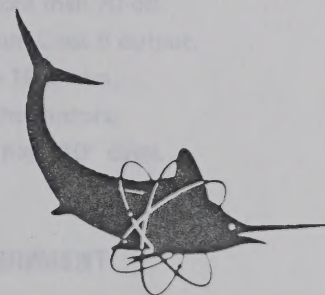
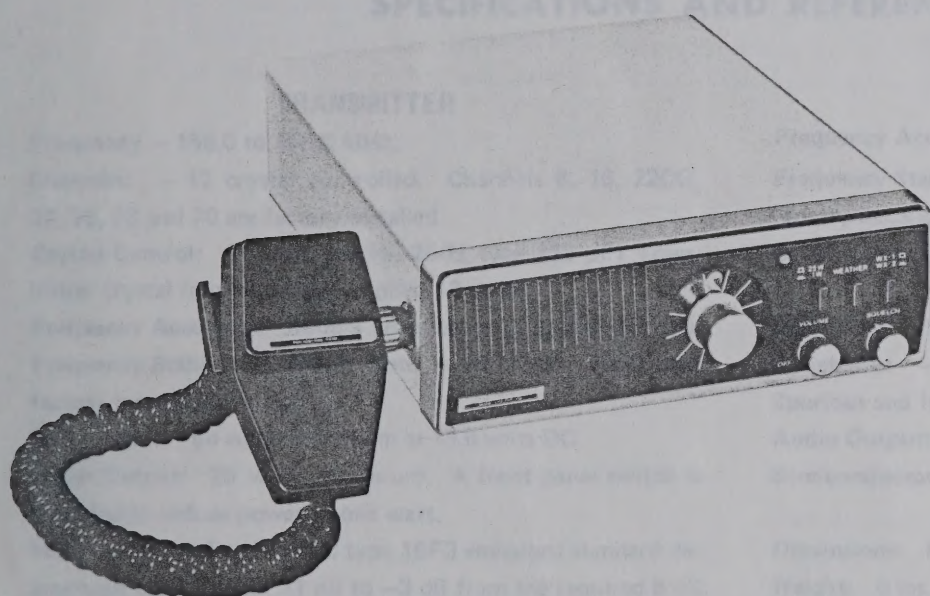


# MARINE RADIO TELEPHONE MODEL 1025 VHF/FM

NOTE: Licensed Technician not required for installation provided that antenna used is as supplied by RAY JEFFERSON and that factory pretuning is not changed



## INSTRUCTION HANDBOOK

PRICE  
FIVE DOLLARS

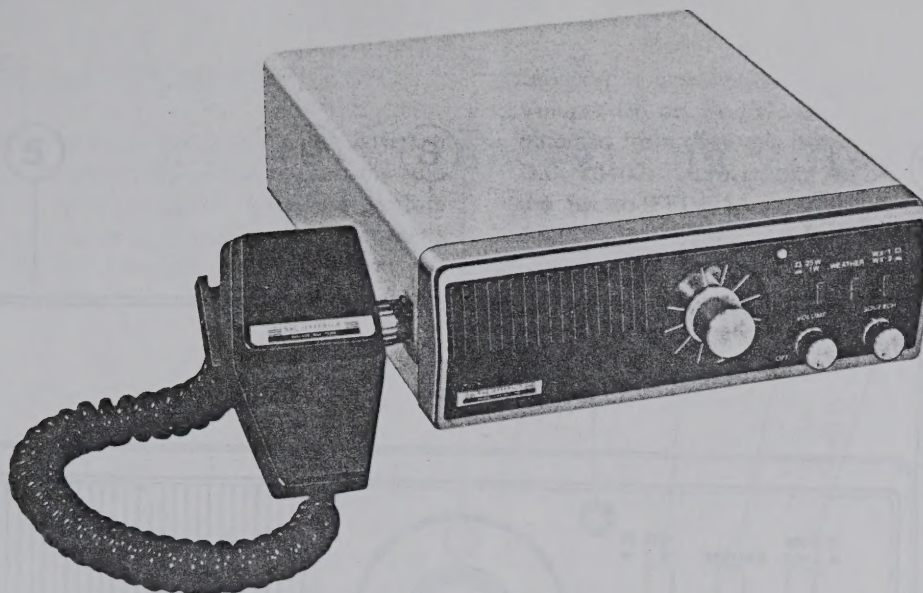
≡ RAY JEFFERSON ≡

VHF/FM MARINE

DIVISION OF JETRONIC INDUSTRIES, INC.







## SPECIFICATIONS AND REFERENCE DATA

### TRANSMITTER

**Frequency** — 156.0 to 158.0 MHz.

**Channels:** — 12 crystal controlled. Channels 6, 16, 22CG, 26, 28, 68 and 70 are factory installed.

**Crystal Control:** Crystals are HC-25/U type (32 pF) Transmitter crystal frequency is multiplied 12 times.

**Frequency Accuracy:** .0005% with factory installed crystals.

**Frequency Stability:** .0005% from  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  with factory installed crystals.

**Power Input:** 54 watts maximum at 13.6 volts DC.

**Power Output:** 25 watts maximum. A front panel switch is provided to reduce power to one watt.

**Modulation:**  $\pm 5$  kHz (FCC type 16F3 emission) standard de-emphasis curve within +1 dB to -3 dB from the required 6 dB per octave curve covering 300 — 3000 Hz. A post limiter filter is employed.

**Deviation Limiter:** Automatic restriction of deviation to  $\pm 5$  kHz.

**Microphone:** Hand held reluctance type.

**Hum and Noise Level:** 45 dB below modulation level.

**Spurious and Harmonic Attenuation:** — 65 dB.

**Antenna Connector:** VHF type S0239 — 50 ohms.

### RECEIVER

14 channel double conversion superheterodyne with crystal controlled oscillator and dual ceramic filter. Double tuned RF stage and mixer, 11.7 MHz IF, 455 kHz limiters with discriminator detection.

**Channels:** 6, 16, 22CG, 26, 28, 68, 70, WX-1 and WX-2 are factory installed.

**Frequency range:** 156.30 to 162.55 MHz.

**Frequency Accuracy:** .001% with factory installed crystals.

**Frequency Stability:** .001% from  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  with factory installed crystals.

**Squelch Sensitivity:** .35 $\mu\text{V}$  threshold  
1.5 $\mu\text{V}$  tight

**Sensitivity:** .5 $\mu\text{V}$  or less for 20 dB quieting.

**Selectivity:** — 60 db @ 25 kHz.

**Spurious and Image Rejection:** More than 70 dB.

**Audio Output:** 3.5 watts maximum Class B output.

**Semiconductors:** 30 transistors 19 diodes.  
5 I.C. and 2 thermistors.

**Dimensions:** 8-1/2" wide, 3-1/2" high, 10" deep.

**Weight:** 6 lbs.

### OPTIONAL EQUIPMENT

**Remote Speaker:** Model RS-109

**Antenna:** Models FG-3, FG-6, FG-8, FG-9, and FG-21.

### ACCESSORIES

**Power Cord:** 6'

**Fuse:** 10 Amp in-line

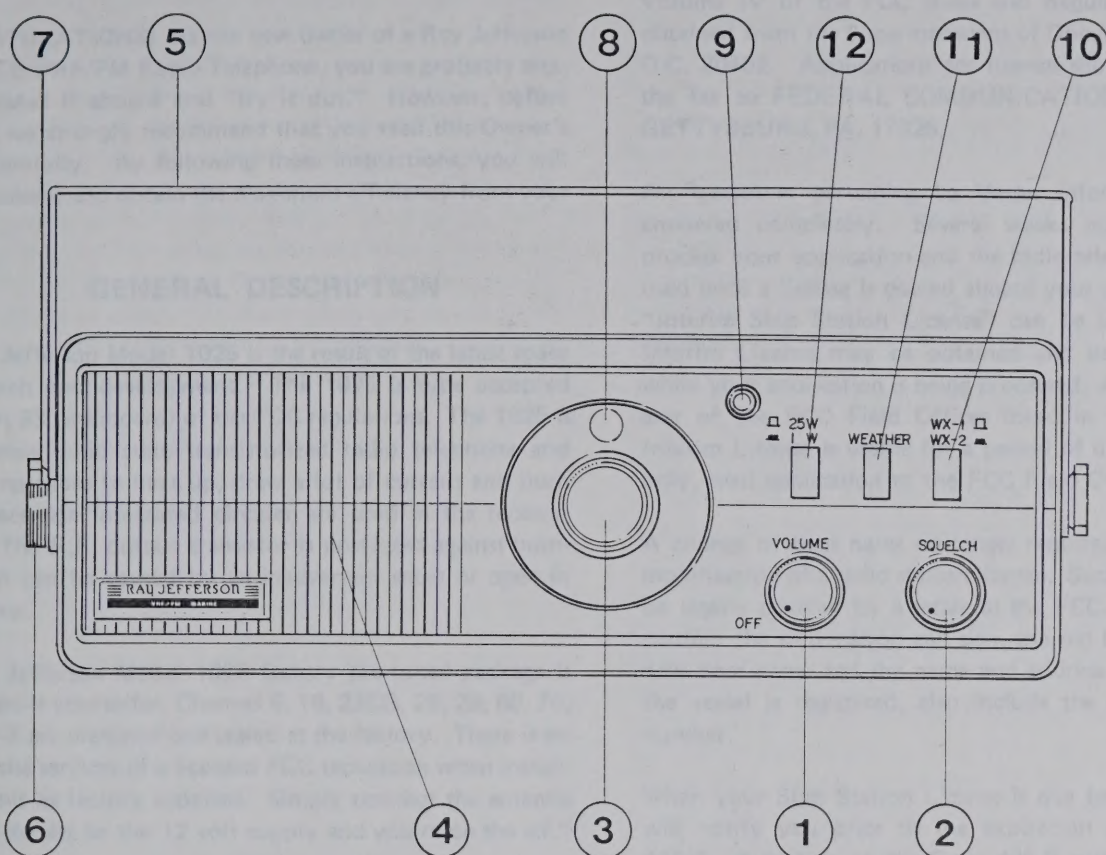
**Mouting:** Universal mounting bracket supplied.

**Power Requirements:**

<b>Supply Voltage:</b>	12 Volts DC	Negative Ground Only
<b>Current Drain:</b>	Transmitter:	Low Power 1.5 Amp
		High Power 5 Amp
	Receiver:	Squelched 0.3 Amps
		Full Power 1.0 Amps
		at 3.5 watts Audio







1. **On-off/volume control:** Turns unit on and adjusts audio output level.
2. **Squelch control:** Adjusts to remove background noise.
3. **Channel Selector:** Selects desired operating channel
4. **Large front panel mounted speaker.**
5. **Universal gimbal mounting bracket.**
6. **Detachable microphone connector.**
7. **Thumb screws:** unit easily removable for storage.
8. **Channel indicating power on light.**
9. **Transmit "on" indicator.**
10. **WX-1-WX-2 selector.**
11. **Weather on selector:** when depressed, automatically, places unit in weather receive mode.
12. **25 watts, 1 watts power selector.**





## MESSAGE TO THE OWNER

**CONGRATULATIONS!** As the new owner of a Ray Jefferson Model 1025 VHF/FM Radio Telephone, you are probably anxious to install it aboard and "try it out." However, before doing so, we strongly recommend that you read this Owner's Manual carefully. By following these instructions, you will avoid problems and obtain the maximum efficiency from your unit.

## GENERAL DESCRIPTION

The Ray Jefferson Model 1025 is the result of the latest space age research and development. The 1025 is type accepted under Part 83 (shipboard) of the FCC regulations. The 1025 is a completely solid state transistorized radio telephone and contains no tubes to heat up, draw a lot of current and burn out. Space age integrated circuits are used in the receiver section. The R.F. output transistor is protected against burn-out which can be caused by an inadvertent short or open in the antenna.

The Ray Jefferson Model 1025 factory pre-tuned package is ideal for do-it-yourselfer. Channel 6, 16, 22CG, 26, 28, 68, 70, W-1 & W-2 are pretuned and sealed at the factory. There is no need for the services of a licensed FCC technician when installing the unit as factory supplied. Simply connect the antenna and wire the set to the 12 volt supply and you're on the air."

**NOTE:** If other crystals are added, all transmitter adjustments must be made by a person holding a minimum of a second class radiotelephone license in accordance with FCC regulations.

**IMPORTANT:** The following must be performed if the antenna used is not factory supplied: a holder of a first or second class FCC license must measure and log frequency, deviation, and power output on page 9.

The 1025 is a 12 channel transmit, 14 channel receive VHF (Very High Frequency) Radio Telephone using FM (Frequency Modulation). The 1025 is designed specifically for use in the 156 to 162 MHz band.

## GENERAL INFORMATION

## RULES AND REQUIREMENTS

Many classes of vessels are not required by law to be equipped with radio-telephone installations. However, all radio stations aboard ships must be licensed by the Federal Communications Commission. A ship's station license is issued only by the FCC Main Office which is located in Washington, D.C. Application for a ship's station license must be made on FCC Form No. 502 which is available from any of the FCC Field Offices listed in this handbook.

Owners and operators of shipboard radio stations are also required by FCC Rule 83.367 to provide Part 83 (Rules and Regulations for Stations on Shipboard in the Maritime

Services) in every shipboard station. Part 83 is contained in Volume IV of the FCC Rules and Regulations and may be obtained from the Superintendent of Documents, Washington, D.C. 20402. Applications for license should be mailed with the fee to FEDERAL COMMUNICATIONS COMMISSION, GETTYSBURG, PA. 17325.

All questions pertaining to Vessel information should be answered completely. Several weeks may be required to process your application and the radio-telephone may not be used until a license is posted aboard your vessel. However, an "Interim Ship Station License" can be issued to you. An Interim License may be obtained and used on your vessel while your application is being processed. Apply, in person, at any of the FCC Field Offices listed in this manual. The Interim License is usable for a period of 6 months. In Alaska only, mail application to the FCC Field Office in Anchorage.

A change of boat name no longer requires an application for modification of a radio station license. Such a change can now be legally covered by a letter to the FCC. The letter should contain the ship station call sign, the old boat name, and the new boat name and the name and address of the licensee. If the vessel is registered, also include the official registration number.

When your Ship Station License is due for renewal, the FCC will notify you prior to the expiration date of FCC Form 405-B. A portion of this Form 405-B must be completed and mailed back to the FCC, Gettysburg, Pa., accompanied by the renewal fee.

## ORDER FORM

**TO:** Superintendent of Documents  
Government Printing Office  
Washington, D.C. 20402

Please enter \_\_\_\_\_ subscription(s) to Volume IV, containing Parts 81, 83 and 85 of the Federal Communications Commission Rules and Regulations. Make checks or money orders payable to the Superintendent of Documents.

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_







The Ship's Station Operator must also have an Operator's License. This license is obtained from the FCC Field Office. Application must be made on FCC Form 753.

The licensee is responsible at all times for the lawful and proper operation of his station. Licenses are granted only to United States citizens. The license is granted primarily for safety of life and property; therefore, distress and safety communications must have absolute priority. Secondarily, however, certain frequencies, which are not reserved for safety or distress calls, may be used for radio-telephone calls to coast stations or between ships. The local telephone company or radio-telephone coast station can furnish the radio-telephone frequencies and the charges for radio-telephone service.

### FCC FIELD OFFICES

Boston, Massachusetts 02109, 1600 Customhouse  
New York, New York 10014, 748 Federal Building,  
641 Washington Street  
Philadelphia, Pennsylvania 19106, 1005 U.S.  
Customhouse  
Baltimore, Maryland 21201, 819 Federal Bldg.,  
31 Hopkins Plaza  
Norfolk Virginia 23502, Military Circle  
807 North Military Highway  
Atlanta, Georgia 30303, 1602 Gaslight Tower,  
235 Peachtree St. N.E.  
Savannah, Georgia 31402, 238 Post Office Building,  
P.O. Box 8004  
Miami, Florida 33130, Room 919, 51 S.W. First Avenue  
Tampa, Florida 33602, 738 Federal Office Building,  
500 Zack Street  
New Orleans, Louisiana 70130, 829 Federal Office  
Building, 600 South Street  
Mobile, Alabama 36602, 439 U.S. Courthouse and  
Customhouse  
Houston, Texas 77002, New Federal Office Building  
515 Rusk Avenue, Room 5636  
Beaumont, Texas 77701, 323 Federal Building, 300  
Willow St.  
Dallas, Texas 75202, Room 13E7 New Federal Court  
House and Office Bldg. 1100 Commerce Street  
Los Angeles, Calif. 90012, Room 1758, U.S.  
Courthouse, 312 North Spring St.  
San Diego, Calif. 92101, Fox Theatre Bldg.  
1245 - 7 th Avenue  
San Francisco, Calif. 94111, 323 - A  
Customhouse, 555 Battery Street  
Portland, Oregon 97204, 314 Multnomah Bldg.  
319 S.W. Pine Street  
Seattle, Washington 98104, 8012 Federal Office  
Building, 1st Avenue and Marion Street  
Denver, Colorado 80202, 504 New Customhouse,  
19th between Calif. & Stout Sts.  
St. Paul, Minnesota 55101, 691 Federal Bldg. &  
U.S. Courthouse, 4th & Robert St.  
Kansas City, Missouri 64106, 1703 Federal Building,  
601 E. 12th Street

Chicago, Illinois 60604, 1872 Everett McKinley Dirksen  
Bldg., 219 South Dearborn St.  
Detroit, Michigan 48226, 1054 New Federal Building  
Wash. Blvd. & Lafayette St.  
Buffalo, New York 14202, 905 Federal Building,  
111 West Huron St.  
Honolulu, Hawaii 96808, 502 Federal Building,  
P.O. Box 1021  
San Juan, Puerto Rico 00903, 322-323 Federal Bldg.,  
P.O. Box 2987  
Anchorage, Alaska 99510, Room G-63 U.S. Post Office  
& Courthouse Bldg. 4th & G St., P.O. Box 644  
Washington, D.C. 20554, Room 216, 1919 N St. N.W.

### OPERATOR LICENSE

The radio-telephone transmitter in a ship station may be operated only by a licensed radio operator. The licensed operator may permit others to speak over the microphone if he starts, supervises, and ends the operation, makes the necessary log entries, and gives the necessary identification. The license usually held by radio operators aboard small vessels not required to carry a radio installation for safety purposes is the Restricted Radio Telephone Operator Permit. This lifetime permit may be obtained without examination by United States citizens in person or by mail from any Commission Field Office upon proper completion of FCC Form 753A. This permit does not authorize transmitter adjustments that may affect the proper operation of the station. Any needed adjustments must be made only by the holder of a first or second class radio-telegraph or radio-telephone license. It is not necessary to post the Restricted Radio Telephone Operator Permit if it is kept on the operator's person; however, other classes of licenses must be conspicuously posted at the principal location at which the station is operated (Rule 83.156).

### TRANSMITTERS

Each ship radio-telephone transmitter requested to be licensed in a new or renewal license under Part 83 of the Commission's Rules for operation must be type accepted under Part 83.

### GOVERNMENT AND FOREIGN FREQUENCIES

A ship may transmit on frequencies not included on the ship station license when directed to do so by U.S. Government stations or foreign coast stations, (Rules 83.357 and 83.363).

### PREVENTION OF INTERFERENCE

Always listen on the channel to be used before transmitting so that you will not interfere with others already using the channel. (Rule 83.181 (b)).

### OPERATING PROCEDURES

You must give your call sign whenever you call another vessel or coast station and when you finish the conversation. Except when talking on the intership frequencies where the maximum







time limit for a conversation is 3 minutes, you must break and announce your call sign if your ship-shore conversation lasts longer than 15 minutes. (Rules 83.364 and 83.366 (g)). Make your calls short (not more than 30 seconds) and do not call that station again for 2 minutes. (Rule 83.366 (f)).

## SAFETY AND DISTRESS

Never forget that SAFETY is the primary reason for having shipboard radio. DISTRESS AND SAFETY must have ABSOLUTE PRIORITY. That is why you must listen, and be able to transmit, on 156.8 MHz. The distress call is "MAY DAY." Read Rule 83.233 (b) and the other rules in Subpart J of Part 83 for complete information about distress calls and messages. If a call to the Coast Guard is needed they may be raised on channel 16 (156.8 MHz).

## RADIO CONVERSATIONS ARE PRIVATE

If you hear a radio conversation not intended for you, you cannot lawfully use the information in any way. (Rule 83.174).

## VIOLATION NOTICES

If you receive an "Official Notice of Violation" from the FCC you must reply to it within ten days receipt. If you cannot give a full answer that soon, you should acknowledge it and say that you will make a full answer as soon as possible. (If you are away from your permanent mailing address, it is suggested that you make arrangements to have mail from the FCC opened, acknowledged and forwarded.)

## LOGS

A radio log is required; each page must be numbered, must have the name of the vessel, call sign, and must be signed by the operator. This log is found on page 9 – 11. Entries shall be made showing the time of beginning and ending each watch on 156.8 MHz. All distress and alarm signals and related communications transmitted or intercepted, and all urgency and safety signals and related communications transmitted, shall be recorded in the log as completely as possible.

A record of all installations, service, or maintenance work performed, which may affect the proper operation of the station, must also be entered by the licensed operator doing the work, including his signature, address and the class, serial number and expiration date of his license. The 24 hour system is used in a radio log, that is 8:45 a.m. is written as 0845 and 1:00 p.m. becomes 1300. (Rule 83.368).

Radio logs must be retained for at least a year; for three years if they contain entries concerning distress or disaster; and longer periods if they concern communications being investigated by the FCC, or against which claims or complaints have been filed. (Rule 83.115)

Any FCC Field Engineering Office will be glad to help you and give you any further information.

## UNPACKING AND INSPECTION

Immediately upon receiving your radio-telephone, carefully unpack the contents and examine them thoroughly outside and inside for damage that may have occurred during transportation due to rough or improper handling. Report any damage immediately to the transportation company or to your authorized Ray Jefferson dealer before disposing of the packaging materials.

## INSTALLATION

The location of the equipment aboard the boat should be chosen with the following in mind:

1. Convenience of operation.
2. Protected location (from salt spray and weather).
3. Antenna should be mounted as high on the boat as practical for greatest range. It should preferably be the highest object on the boat.

A Ray Jefferson VHF/FM antenna should be used for best performance. It is connected to the set by means of a 50 ohm coaxial cable using a PL-259 plug. A Perko #424 cable outlet may be used for a watertight entry.

A mounting cradle is furnished that permits you to mount the set on a shelf or, by reversing the cradle, it can be mounted on the cabin overhead. Remove thumb screw to mount cradle.

The wires from the power plug connector must be connected directly to the battery, not to switches, common terminals, ammeter or circuit breakers. If more wire is needed install a junction box and use #10 or 12 GA. for the rest of the run. The red wire is positive and the other negative. Note that the connector is polarized. Do not force.

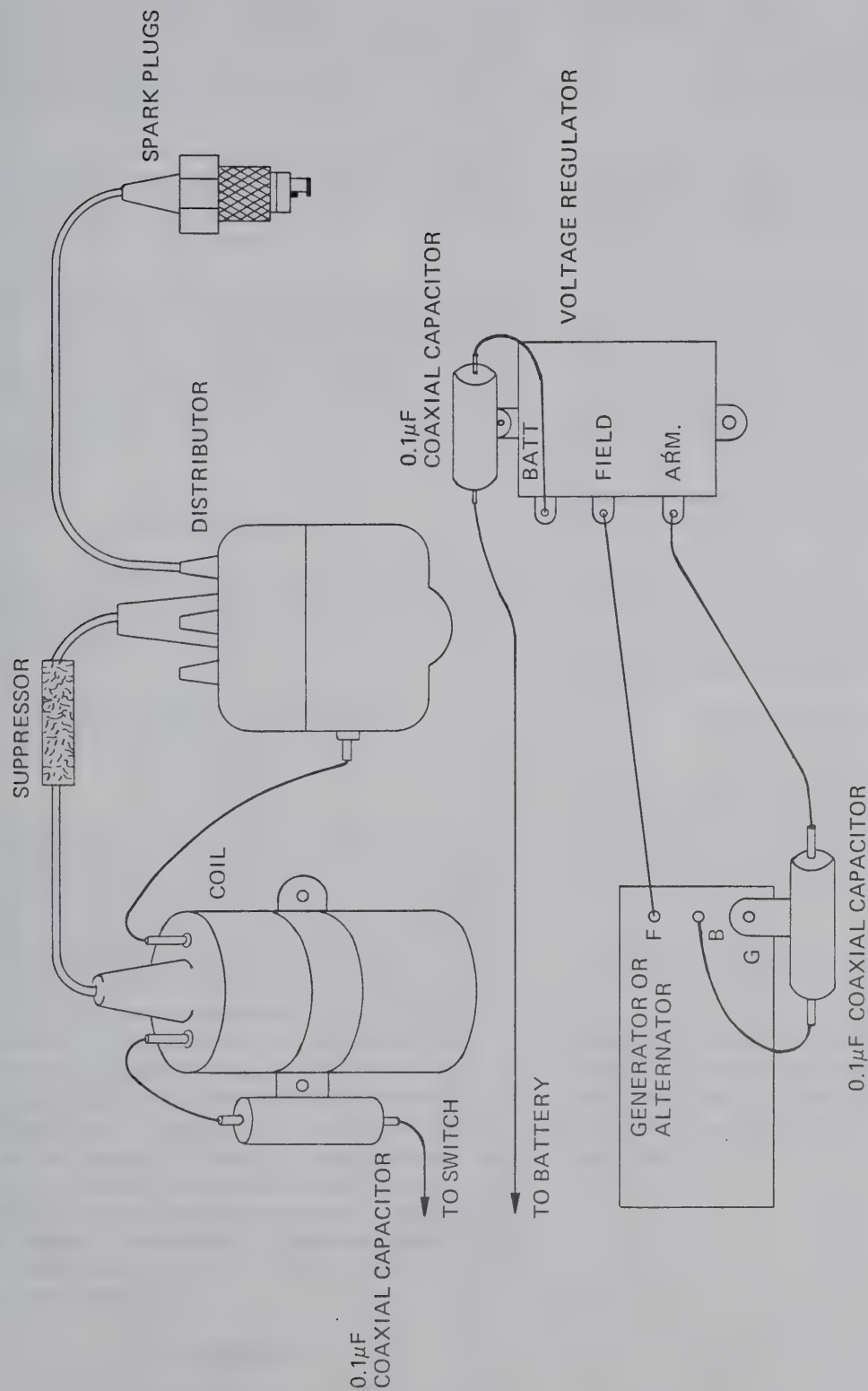
**Engine Noise Suppression:** While light ignition noise interference is not as bothersome on VHF-FM as it is on other bands, noise suppression should be done even though it does not seem to be annoying. Noise pulses chop "holes" in the received signal and weak stations can be completely blanked out.

The following procedure for basic noise elimination will also improve reception on other radios and direction finders and provide better operation of all types of depth sounders.

**Spark Plugs:** On some makes of engines, Champion "U" type spark plugs (such as UJ6) are specified. We have found that it is impossible to eliminate noise caused by these plugs as they have an extra spark gap near the top of plug which causes the leads to radiate this noise. The remedy is to replace these with resistor type plugs or, better yet, use standard spark plugs with the new MSW cables. This cable looks like ordinary cable, but instead of a solid or carbonized conductor, it consists of a







In some cases, a larger capacitor is required to suppress the whining noise. 1.0MF usually is sufficient, however in stubborn cases, a choke and condenser combination may be required.

## BASIC NOISE SUPPRESSION FOR GASOLINE ENGINES – 150-175 MHz





coiled winding of monel wire over a ferrite core which acts as an RF choke reducing the noise to a very low level. As this wire has a very low resistance compared to the usual suppressors, there is no loss in engine performance. These cables are sold in complete sets packaged for most engines and can be snapped in place in a few minutes.

**Ignition Coils:** Coils should be mounted on the engine. Clean away paint to insure good ground. Certain coils such as the Mallory plastic encased unit radiate excessive noise and should be replaced with a standard metal cased unit.

**Voltage Regulators:** Older types of regulators contain a vibrating set of contacts to control voltage. If the usual capacitors don't quiet the frying noise, replace with a solid state regulator which has no moving parts.

**Tachometers:** Some electrical tachometers cause considerable radiation of spark noise. This type of tach connects to the points at the distributor. Disconnect the tach wire at the distributor and note the noise reduction. This lead should be shielded and the plastic cased sender unit which contains a vibrating set of contacts should be completely shielded in a metal enclosure.

## OPERATION

When your Model 1025 has been properly installed and you have made the proper entry in your ship's radio log, you may begin radio-telephone communication.

### OPERATING PROCEDURE

#### TO RECEIVE

Turn the Model 1025 power switch ON. This switch is part of the volume control. (The pilot lamp behind the channel selector should light indicating the receiver is on). Insure that the weather button is not pressed in. Set the channel selector to 16. This is the channel you are required to monitor and to make your initial radio contact on. The 1025 is ready for instant reception or transmission on the selected channel since it is completely transistorized and does not require a warm-up period. Adjust the Volume control for the desired listening level and then adjust the Squelch control to a point where the audible hissing noise is just cut off. If some other station is transmitting on Channel 16, adjust the Squelch control to a point where the speech is clear but the noise between transmissions is cut out. DO NOT attempt to transmit on Channel 16, if another station is transmitting. To receive weather simply press the weather button in. WX-1, 2 switch should be pressed in for WX-2 and out for WX-1.

#### TO TRANSMIT

Turn the Model 1025 power switch ON. Monitor Channel 16 to be sure the channel is clear before operating your transmitter. Transmission starts the moment you depress the switch

on the microphone. Depress the microphone switch and talk directly into the microphone holding it close to your mouth. The red light will go on when microphone switch is pressed. To receive, you must release the microphone switch. The proper procedure for radiotelephone communication is given in the example below.

**EXAMPLE:** "Bluebird — this is Sailfish WXZ9999." When your party answers on Channel 16, "Sailfish, this is Bluebird WXX8888, switch to Channel 68" or the channel desired and continue your communication.

To alleviate congestion on Channel 16, the FCC recommends that calls from the boat to all shore stations (except the Coast Guard) be made on the shore station's working frequency.

If you are attempting to contact Bridge Tenders or Lock Operators, you must operate your transmitter in the LOW position. LOW power should also be used whenever possible to prevent interfering with other radio-telephone users. If not possible to communicate using LOW Power, switch to HIGH. Press 25W — 1W switch in for low power.

When you have completed your radio-telephone conversation, you must sign off giving your FCC assigned call sign.

**EXAMPLE:** "EZX9999 OFF."

We recommend the use of RTCM publications on radio-telephone procedures for more complete information.

## OPERATOR'S MAINTENANCE

To keep the Model 1025 in "like new" condition, wax cabinet and panel with a regular auto type wax polish. Under no circumstances, spray the inside of the unit with any type of so called protective spray as many of the component parts can be ruined and your guarantee will be voided.

Your antenna and connection should be inspected at least once a year by a competent licensed technician.

The VSWR should be measured and faults corrected where necessary to insure the lowest possible VSWR to prolong the life of the transistors. FCC regulation 83.157 requires that all transmitter maintenance must be performed by a licensed technician.





# MARINE CHANNELS AND THEIR USAGE

OPERATING CHANNEL DESIGNATIONS	FREQUENCY (MHz)		TYPE OF TRAFFIC	FUNCTION	
	SHIP TX	COAST TX		SHIP/SHIP	SHIP/ShORE
1	156.05	160.65	International Only	—	Yes
2	156.1	160.7	International Only	—	Yes
3	156.15	160.75	International Only	—	Yes
4	156.2	160.8	International Only	—	Yes
5	156.25	160.85	International Only	—	Yes
6	156.3	—	SAFETY	Yes	No
7	156.35	160.95	International Only	—	Yes
7A	156.35	156.35	Commercial	Yes	Yes
8	156.4	—	Commercial	Yes	No
9	156.45	156.45	Commercial	Yes	Yes
9	156.45	156.45	Noncommercial	No	Yes
10	156.5	156.5	Commercial	Yes	Yes
11	156.55	156.55	Commercial	Yes	Yes
12	156.6	156.6	Port Operations, USCG	Yes	Yes
13	156.65	156.65	Locks, Canals, Pilots	Yes	Yes
14	156.7	156.7	Port Operations, USCG	Yes	Yes
15	—	156.75	Environ, Hydrographic	Ship receive only	Ship receive only
16	156.8	156.8	DISTRESS-CALLING	Yes	DISTRESS-CALL
17	156.85	156.85	State Control Restricted	No	Yes
18	156.9	161.5	International Only	Yes	Yes
18A	156.9	156.9	Commercial	Yes	Yes
19	156.95	161.55	International Only	Yes	Yes
19A	156.95	156.95	Commercial	Yes	Yes
20	157.0	161.6	Port Operations	Yes	Yes
21	157.05	161.65	International Only	—	Yes
21CG	157.05	157.05	USCG Restricted	Yes	Yes
22	157.1	161.7	Coast Guard	Yes	Yes
22CG	157.1	157.1	USCG Restricted	Yes	Yes
23	157.15	161.75	International Only	—	Yes
23CG	157.15	157.15	USCG Restricted	Yes	Yes
24	157.2	161.8	Public Corresp.	No	Yes
25	157.25	161.85	Public Corresp.	No	Yes
26	157.3	161.9	Public Corresp.	No	Yes
27	157.35	161.95	Public Corresp.	No	Yes
28	157.4	162.0	Public Corresp.	No	Yes
60	156.025	160.625	International Only	Yes	Yes
61	156.075	160.675	International Only	Yes	Yes
62	156.125	160.725	International Only	Yes	Yes
63	156.175	160.775	International Only	Yes	Yes
64	156.225	160.825	International Only	Yes	Yes
65	156.275	160.875	International Only	Yes	Yes
65A	156.275	156.275	Port Operations	Yes	Yes
66	156.325	160.925	International Only	Yes	Yes
66A	156.325	156.325	Port Operations	Yes	Yes
67	156.375	—	Commercial	Yes	No
68	156.425	156.425	Noncommercial	Yes	Yes
69	156.475	156.475	Noncommercial	No	Yes
70	156.525	—	Noncommercial	Yes	No
71	156.575	156.575	Noncommercial	No	Yes
72	156.625	—	Noncommercial	Yes	No
73	156.675	156.675	Port Operations	Yes	Yes
74	156.725	156.725	Port Operations	Yes	Yes
75	GUARD CHANNEL		—	—	—
76	GUARD CHANNEL		—	—	—
77	156.875	—	Commercial	Yes	No
78	156.925	161.525	International Only	Yes	Yes
78A	156.925	156.925	Noncommercial	No	Yes
79	156.975	161.575	International Only	Yes	Yes
79A	156.975	156.975	Commercial	Yes	Yes
80	157.025	161.625	International Only	Yes	Yes
80A	157.025	157.025	Commercial	Yes	Yes
81	157.075	161.675	International Only	—	Yes
81A	157.075	157.075	COAST GUARD AUXILIARY	—	—
82	157.125	161.725	International Only	—	Yes
83	157.175	161.775	International Only	—	Yes
83CG	157.175	157.175	USCG Aux. Only	Yes	Yes
84	157.225	161.825	Public Corresp.	No	Yes
85	157.275	161.875	Public Corresp.	No	Yes
86	157.325	161.925	Public Corresp.	No	Yes
87	157.375	161.975	Public Corresp.	No	Yes
88	157.425	162.025	International and Public Corresp. (Great Lakes Only)	Yes	Yes
88A	157.425	—	Commercial	Yes	No
WX1	—	162.55	NOAA weather	Ship receive only	Ship receive only
WX2	—	162.40	NOAA weather	Ship receive only	Ship receive only
TX = TRANSMIT					





# RADIO LOG

RAY JEFFERSON MODEL 1025 VHF-FM RADIOTELEPHONE

Date of Calibration 2/13/78 Time 9:23 AM EST

## TRANSMITTER FREQUENCY MEASUREMENTS

CHANNEL SERVICE	FREQUENCY	ERROR	DEVIATION kHz
6	156,300	+700	5
16	156,800	+400	
22CG	157,100	+400	
26	157,300	+200	
28	157,400	+300	
68	156,425	+300	
70	156,525	+200	
WX-1	✓		
WX-2	✓		

Equipment Used to Measure: Cushman CE-3 with Model 303 Plug in \_\_\_\_\_

Modulation Deviation: Cushman CE-3 with Model 301 Plug in \_\_\_\_\_

Technician \_\_\_\_\_

License No. and Expiration Date \_\_\_\_\_

*Stamp*



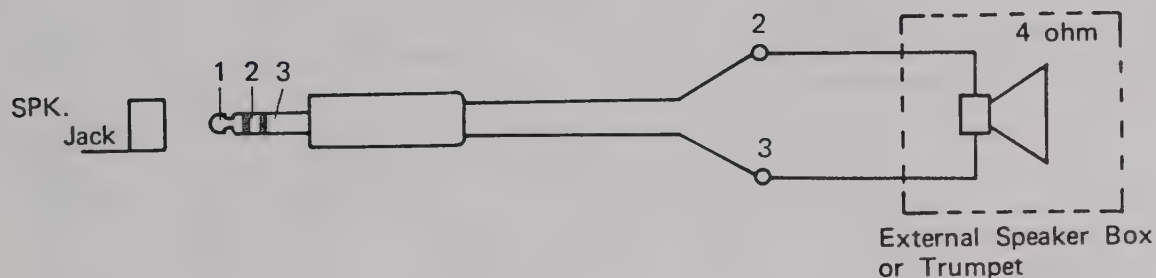


## EXTERNAL SPEAKER SYSTEMS

The MODEL 1025 can be used with a variety of External speaker systems by making use of "REMOTE/EXT. SP" jack on the rear pane. The two speaker systems we recommend are as follows:

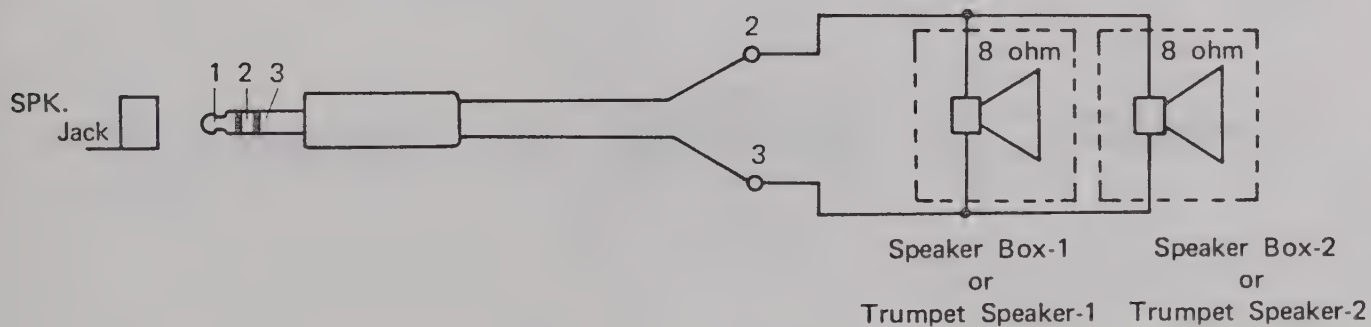
### SYSTEM 1

When cutting off the internal speaker and operating the external speaker only, connect the external speaker to a two conductor standard stereophone plug and insert the plug into the REMOTE/EXT SP. jack. See below.



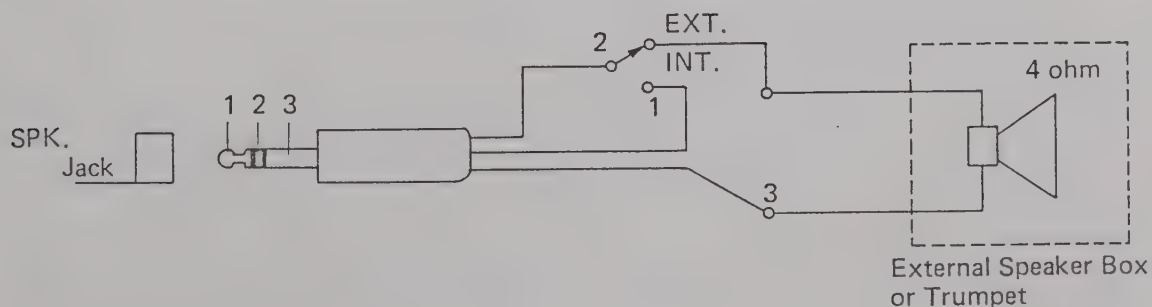
### SYSTEM 2

When cutting off the internal speaker and using two external speakers, connect as follows and insert the plug into the REMOTE/EXT SP. jack.



### SYSTEM 3

When cutting on or off the internal speaker in a remote location, connect and wire as follows and insert the plug into the REMOTE/EXT. SP jack.





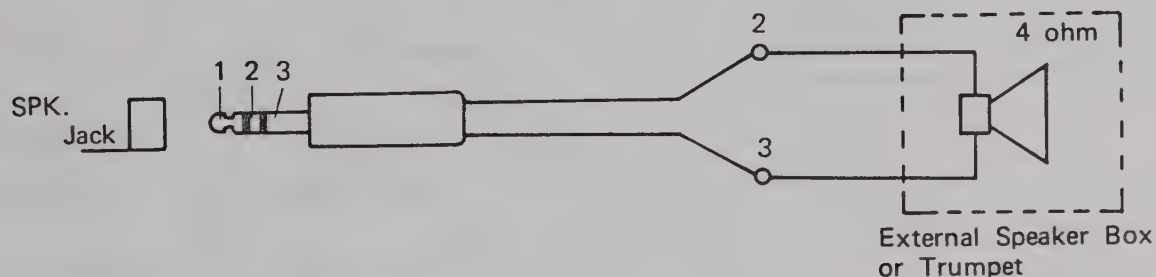


## EXTERNAL SPEAKER SYSTEMS

The MODEL 1025 can be used with a variety of External speaker systems by making use of "REMOTE/EXT. SP" jack on the rear pane. The two speaker systems we recommend are as follows:

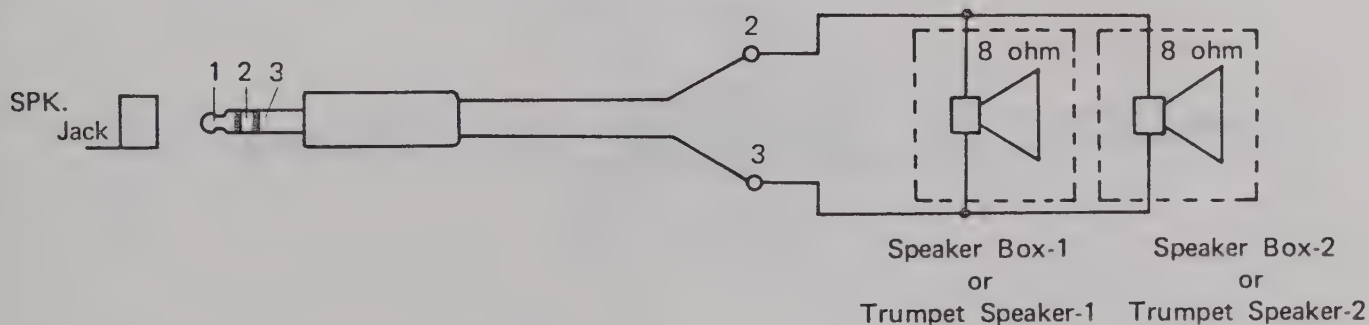
### SYSTEM 1

When cutting off the internal speaker and operating the external speaker only, connect the external speaker to a two conductor standard stereophone plug and insert the plug into the REMOTE/EXT SP. jack. See below.



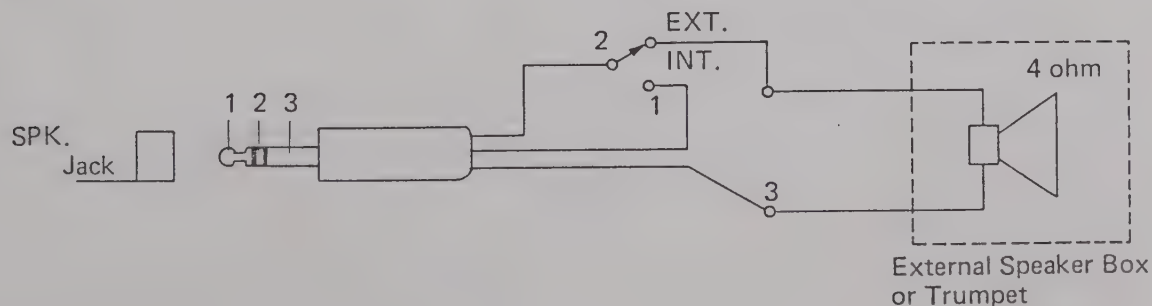
### SYSTEM 2

When cutting off the internal speaker and using two external speakers, connect as follows and insert the plug into the REMOTE/EXT SP. jack.



### SYSTEM 3

When cutting on or off the internal speaker in a remote location, connect and wire as follows and insert the plug into the REMOTE/EXT. SP jack.





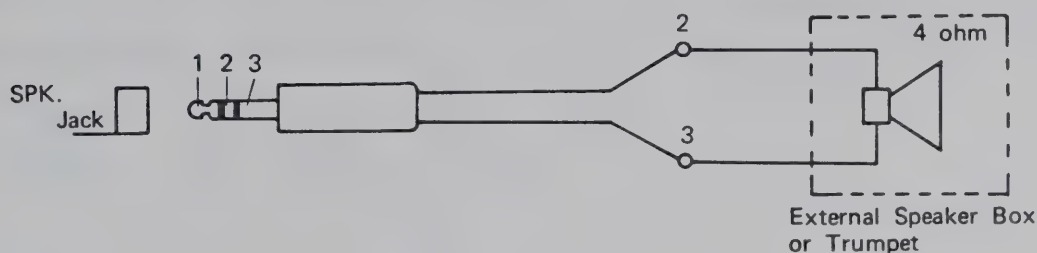


## EXTERNAL SPEAKER SYSTEMS

The MODEL 1025 can be used with a variety of External speaker systems by making use of "REMOTE/EXT. SP" jack on the rear pane. The two speaker systems we recommend are as follows:

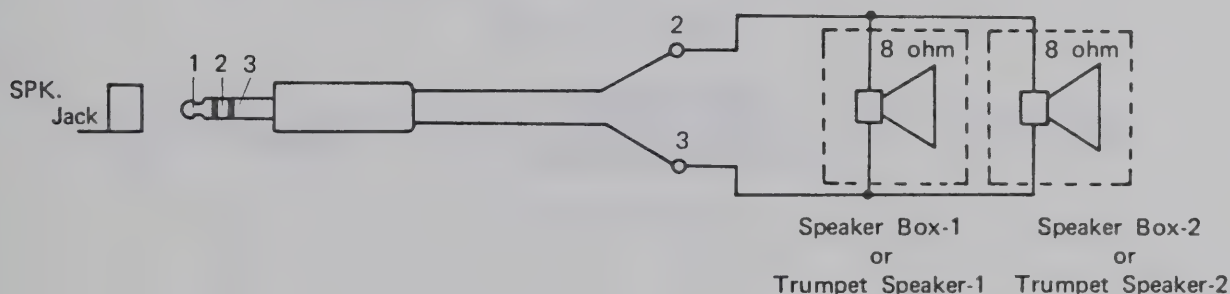
### SYSTEM 1

When cutting off the internal speaker and operating the external speaker only, connect the external speaker to a two conductor standard stereophone plug and insert the plug into the REMOTE/EXT SP. jack. See below.



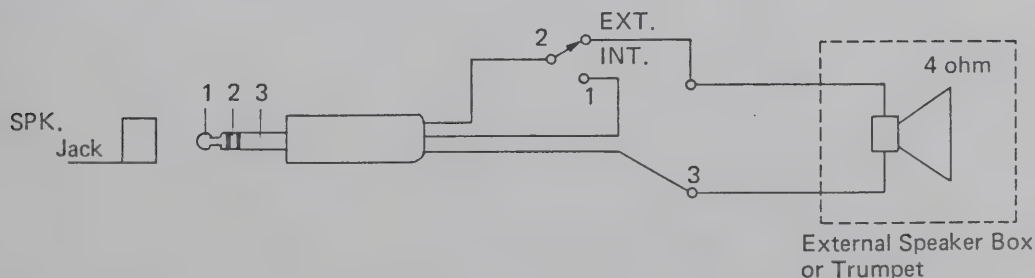
### SYSTEM 2

When cutting off the internal speaker and using two external speakers, connect as follows and insert the plug into the REMOTE/EXT SP. jack.



### SYSTEM 3

When cutting on or off the internal speaker in a remote location, connect and wire as follows and insert the plug into the REMOTE/EXT. SP jack.



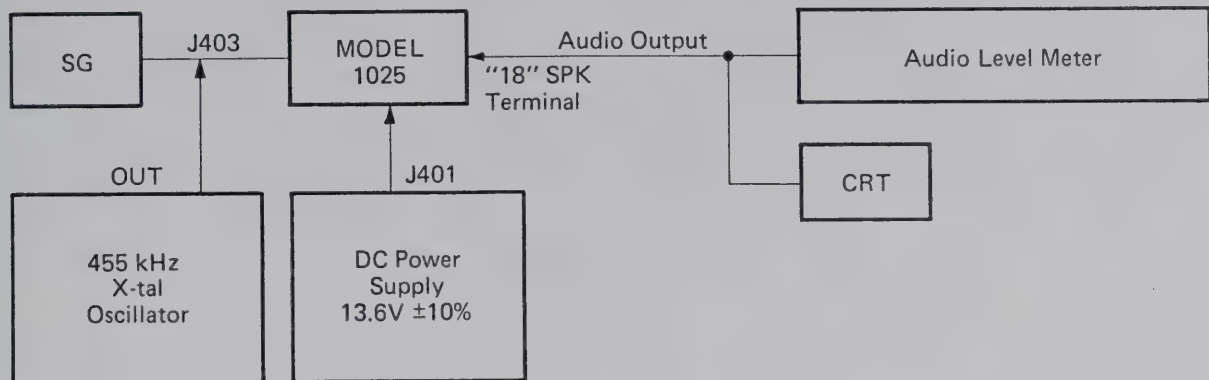




# RECEIVER ALIGNMENT PROCEDURES

The following test equipments (shown in Test Set-Up) and tools are necessary in the receiver alignment.

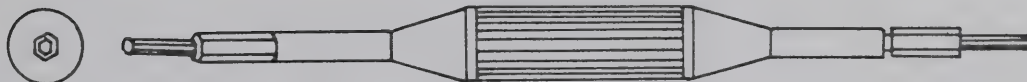
## 1. Standard Test Set-Up



## 2. Tools



Driver A - Bakelite



Driver B - Hex type







## RECEIVER ALIGNMENT PROCEDURES

Test-Set-Up: See preceding page.

STEP	ADJUST- MENT	TEST POINT	STAGES AND ALIGNMENT PROCEDURES
1	T206 and T207  1st Local OSC Multiplier	TP205	<p>Connect plus tester lead to TP205 and minus tester lead to shassis ground.</p> <ol style="list-style-type: none"> <li>Place channel selector switch in 16 (156.80 MHz) channel. Rotate T206 core for maximum reading on the tester.</li> <li>Next, change the channel to receive weather frequency, 162.55 MHz and turn the core of T207 for maximum deflection on the tester.</li> <li>Repeat the steps a. and b. so that the voltage reading falls within 0.5 - 1.1V at each frequency, 156.80 MHz and 162.55 MHz.</li> </ol> <p>Note: Use special care in the above alignment because the circuits are very critical.</p>
2	T208 and T209  1st Local OSC Multiplier	TP202	<p>Connect plus tester lead to TP205 and minus tester lead to shassis ground.</p> <p>Set Channel to "26" (161.90 MHz) and turn each core of T208 and T209 to obtain maximum deflection on the tester, using hex driver.</p> <p>Be sure that the readings on the tester are between 1.8V and 2.6V at each 156.80 MHz, 161.90 MHz and 162.55 MHz channel.</p>
3	T210, T211, T212, T213, T214, T215  11.7 MHz IF Amp.	TP210 TP212	<p>Set channel to "26" (161.90 MHz).</p> <p>Set Signal Generator frequency to 161.90 MHz, and increase the generator output to a high level. Connect plus tester lead to TP212 and minus lead to chassis ground.</p> <p>Slightly adjust signal generator frequency dial so that the tester should read "0" V.</p> <p>Remove the tester leads and connect them to TP210 and ground. Adjust signal generator output so that the tester reads 0.2V.</p> <p>Rotate each core of T210, T211, T212, T213, T214 and T215 for maximum reading on the tester.</p> <p>Note: With the alignment being proceeded, the voltage reading on the tester will rapidly increase and may reach to a saturation level. Then, decrease the signal generator output so that the voltage reading will always kept around 0.2V on the tester.</p> <p>These alignments are very critical, so great care will be necessary.</p>
4	T201, T202, T203, T204, T205  RF Amp.	TP210 TP212	<p>Set channel selector to "26" (161.90 MHz).</p> <p>Set Signal generator to the 161.90 MHz and increase signal output to a proper level.</p> <p>Slightly adjust signal generator frequency dial to obtain "0" reading on the tester connected to the TP212.</p> <p>Next, remove tester leads and connect a plus lead to TP210 and minus lead to chassis ground.</p> <p>Adjust signal generator output so that the tester should read 0.2V.</p> <p>Turn each core of T201, T202, T203, T204 and T205 for maximum deflection on the tester. Always decrease the signal generator output when the reading on the tester reaches to saturation level as the alignment is being proceeded. It is recommendable that the reading is kept around 0.2V.</p>

STEP	ADJUST- MENT	TEST POINT	STAGES AND ALIGNMENT PROCEDURES
4 [continued]	T201, T202 T203, T204, T205  RF Amp.	TP210 TP212	<p>Change channel selector to "16" (156.80 MHz) and tune the signal generator frequency to the same frequency (Adjust for "0" reading on the circuit tester connected to TP212.)</p> <p>Connect plus tester lead to TP210 and minus lead to ground. Adjust T202 and T205 for maximum reading on the tester.</p> <p>Set Signal generator output to <math>3\mu V</math> and check that the readings on the tester connected to TP210 are more than 0.12V at each 156.80 MHz, 161.90 MHz and 162.55 MHz.</p>
5	R246 Max. Squelch Setting	Audio Level Meter	<p>This alignment should be performed after completely finishing the step 1 through 5 without any defects.</p> <p>Set the receiver in the standard test conditions.</p> <p>Set channel selector to "26" (161.90 MHz).</p> <p>Set signal generator output to provide <math>1\mu V</math>.</p> <p>Turn signal generator frequency dial and tune to the receiver to 161.90 MHz so that zero reading is obtained on the tester connected to TP212.</p> <p>Set signal generator modulation to 3.5 kHz deviation with 1 kHz audio signal.</p> <p>Turn Squelch control on the front panel of the receiver to max position (fully counter clockwise).</p> <p>Adjust R246 so that audio output just disappears.</p> <p>Note: When there is no audio signal output with R246 untouched, adjust R246 in reverse direction to obtain an audio output, then turn the R246 in the reverse direction so that the audio output just disappears.</p>
6	1st Local OSC Frequency Adjustment	Frequency Counter	<p>A precision frequency counter will be necessary to align the 1st Local Oscillator frequencies. The radiated energy from the 1st Local Oscillator will be coupled to the frequency counter input. One of the following three stages will be selected as the one to be coupled, according to your counter's frequency range capable of frequency measuring.</p> <ol style="list-style-type: none"> <li>1st Local Oscillator circuit</li> <li>1st Tripler circuit</li> <li>2nd Tripler circuit</li> </ol> <p>The relations between receiving frequency and measured frequency are decided as below, depending on the stage to which the frequency counter is connected.</p> <ol style="list-style-type: none"> <li>1st Local Oscillator circuit <p>Frequency reading on Counter <math>f_{L1} = \frac{f_c - 11.7}{9}</math> MHz</p> </li> <li>1st Tripler circuit <p>Frequency reading on Counter <math>f_{L2} = \frac{f_c - 11.7}{3}</math> MHz</p> </li> <li>2nd Tripler circuit <p>Frequency reading on Counter <math>f_{L3} = f_c - 11.7</math> MHz</p> <p>Where, <math>f_c</math> = receiving frequency (MHz) = channel frequency.</p> </li> </ol> <p>Adjust each trimmer corresponding to the channel to be aligned to obtain the exact frequency calculated from the above formulas.</p>





# TRANSMITTER ALIGNMENT PROCEDURES

## 1. OUTPUT ALIGNMENT

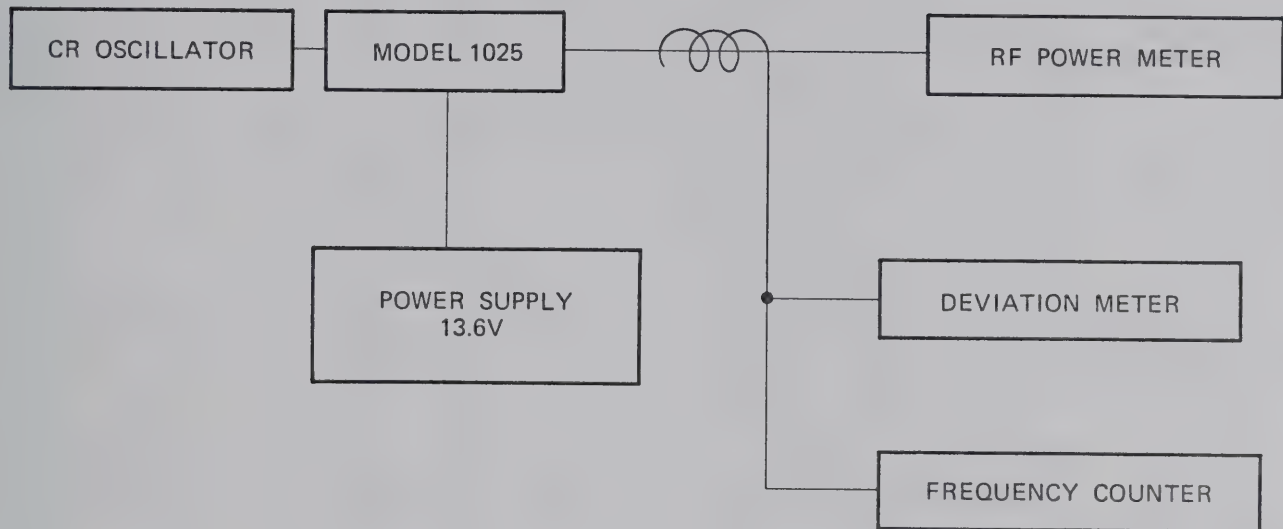
### 1.1 Required Measurement Equipments:

1. RF power meter
2. DC power supply
3. Circuit tester
4. VTVM

### 1.2 Set channel selector switch to "16".

### 1.3 Place Hi-Lo power switch in the "Hi" position.

### 1.4 Standard Alignment Set-Up, see below.



### 1.5 Alignment drivers



"bakelite driver"



"Minus driver"



STEP	TOOL REQ'D	ADJUST-MENT	POSITION TO BE ADJUSTED	STAGE AND ALIGNMENT PROCEDURE
1	Bake Driver		TP101	<b>X-tal Oscillator (Q101) Alignment</b> Connect a RF VTVM between the test point TP101 (emitter of Q101) and ground. Depress the Push-to-Talk Switch. Read the VTVM, reading should be about 1.3 V.
2	"	L103	TP104	<b>Amplifier (Q103)</b> Connect a circuit tester (5V range) between TP104 and ground. Depress the Push-to-Talk Switch and adjust L101, L102 and L103 for maximum voltage reading on the circuit tester. The voltage reading should be about 3.0 V.
3	"	L104 L105	TP105	<b>Tripler (Q104) Alignment</b> Connect circuit tester (5V range) between the TP105 and ground. Adjust L104 and L105 for maximum voltage reading on the tester. The voltage reading should be about 1.0 V.
4	"	L106 L107	TP106	<b>1st Doubler (Q105) Alignment</b> Connect circuit tester (5V range) between the TP106 and ground. Depress the Push-to-Talk Switch and adjust L106 and L107 for maximum voltage reading on the tester. The voltage reading should be about 0.8 V.
5	"	L108 CT113 CT114	TP107	<b>2nd Doubler (Q106) and Pre-Driver (Q107) Alignment</b> Connect circuit tester (10V range) between TP107 and ground. Depress the Push-to-Talk Switch and adjust L108, CT113 and CT114 for maximum voltage reading on the tester. The voltage reading should be about 4.0 V.
6	"	CT115	TP108	<b>Driver (Q108) Amplifier Alignment</b> Connect circuit tester (10V range) between the TP108 and ground. Depress the Push-to-Talk Switch and adjust CT116 for maximum voltage reading on the tester. The voltage reading on the tester should be about 6.0 V.
7	"	CT115 CT116	RF OUTPUT Meter	<b>Power Amplifier (109) Alignment</b> Connect an RF Output Meter to the antenna connector of the unit and adjust CT115 and CT116 for maximum reading on the Power Meter and repeat the above steps 6 and 7 for maximum reading on the Power Meter. The voltage reading on the Power Meter indicates RF power output; the reading 12V corresponds to about 20W power output respectively.





## 2. MODULATION ALIGNMENT

### 2.1 Required Alignment Equipments:

1. RF Power Meter
2. DC Power Supply
3. Deviation Meter
4. CR Oscillator

STEP	TOOL REQ'D	ADJUST-MENT	ALIGNMENT METHODS
1	Minus or Bake Driver	R152	An IDC circuit is employed in modulating circuit in the Unit. Connect a CR audio generator to the MIC input and feed the audio output larger than the standard input voltage (1.2 mV). Adjust the trimming resistor R152 so that the modulation meter connected should read 4.8 kHz. (This means that 2/3 rated system deviation will be obtained for the audio signal input of about 1.2 mV.)

## 3. TRANSMITTER FREQUENCY ADJUSTMENT

### 3.1 Required Alignment Equipments:

1. RF Power Meter
2. DC power supply
3. Frequency Meter or Counter

STEP	TOOL REQ'D	ADJUST-MENT	ALIGNMENT METHODS
1	Minus or Bake Driver	CT101 to CT112	Measure output frequency by inductively coupling the Frequency Meter or Counter to the final RF amplifier stage and adjust frequency adjusting trimmer (CT101 - CT112) near the crystal for the correct frequency with an error of less than 1 PPM (150 Hz).





## TX TEST POINT AND STANDARD VOLTAGE VALUE CHART

TEST POINT NO.	TEST POINTS	STANDARD VOLTAGE VALUE	MEASURING CONDITION
TP101	Oscillator (Q101) Emitter check	DC 4V (3 ~ 4.5V)	5V (range) VTVM (5V range)
		RF 1.3V (1.1 ~ 1.5V)	
TP103	AMP (Q103) Emitter Check	1.5V (1.0 ~ 2.0V)	5V (range)
TP104	Tripler (Q104) Emitter check	3.0V (2.7 ~ 3.2V)	5V (range)
TP105	1st Doubler (Q105) Emitter check	1.0V (0.7 ~ 1.2V)	5V (range)
TP106	2nd Doubler (Q106) Emitter check	0.8V (0.6 ~ 1.0V)	5V (range)
TP107	Driver (Q108) Base Input check	3.3V (3 ~ 4V) VTVM 4.0V (2.5 ~ 5.5V) Tester	10V (range)
TP108	Power Amp. (Q109) Base Input Check	6.8V (6 ~ 7.3V) VTVM 4V (3.8 ~ 4.5V) Tester	10V (range)
TP109	IC 102 Check	5.5V (4.0 ~ 6.0V)	5V (range)
TP110	IC 101 Check	6.5V (6 ~ 7.5V)	5V (range)
TP111	AVR (Q113) Output Voltage Check	9.5V (8.5 ~ 10V)	50V (range)
TP112	Switch (Q114) Check	9V (8 ~ 9.5V)	50V (range)
TP113	Switch (Q115) Check	9.0V (8.0 ~ 9.5V)	50V (range)
TP114	Reflected Power Check	0.7V (0.5 ~ 1.5V)	5V (range)
TP115	PRE-DRIVER	0.35V (0.2 ~ 0.5V)	5V (range)

- NOTE:
1. Use a circuit tester having internal impedance of 20k $\Omega$ /V or equivalent.
  2. All voltages were measured from common chassis.



# RECEIVER TEST POINTS AND STANDARD VOLTAGE VALUE CHART

TEST POINT NO.	TEST POINTS	STANDARD VOLTAGE VALUE	MEASURING CONDITION
TP201	RF Amplifier Circuit Q201 3SK40 Source volts	1.5V $\pm 20\%$	3V range
TP202	1st Mixer Circuit Q202 2SK23A Source volts	1.8 – 2.6V (1.1V $\pm 20\%$ )	3V range
TP203	1st Local Oscillator Q203 2SC838 Emitter volts	2.5 – 3.5V (2.5 $\pm 20\%$ )	12V range
TP204	1st Tripler Circuit Q204 2SC838 Emitter volts	0.5 – 0.9V (0.12 $\pm 20\%$ )	1.2V range
TP205	2nd Tripler Circuit Q205 2SC387A Emitter volts	0.5 – 1.1V (0 – 0.3V)	1.2V range
TP206	Local Output Check	0.1 – 0.9V	1.2V range
TP207	2nd Mixer Circuit Q206 2SK23A Source volts	1.5V $\pm 20\%$	3V range
TP208	2nd Local Oscillator Q207 2SC838 Emitter volts	3.7V $\pm 20\%$	12V range
TP209	455 kHz IF Amplifier IC201 TA7061AP Pin No. 5	8.5V $\pm 20\%$	12V range
TP210	Signal Input Test (Measurement) Terminal (S Meter output terminal)	more than 0.2V at signal input 4 $\mu$ V, (0.05 $\pm 20\%$ )	1.2V range
TP211	Limiter Circuit IC202 TA7060P Pin No. 5	8.5V $\pm 20\%$	12V range
TP212	Discriminator Check (Center Frequency Measurement terminal)	$\pm 0$ V ( $\pm 0.1$ V)	3V range

- NOTE:
1. Use a circuit tester having an internal impedance of 20k $\Omega$ /V or equivalent.
  2. Voltages in parenthesis are measured with no crystals inserted or at no signals.





# MODEL 1025 PARTS LIST

Description		Designation	Part #
P. W. B. Assy.		_____	AP - TTX008AA
"		_____	AP - TRX008AA
Push SW.		SW302, SW304, SW305	SP - 03CAX02A
Rotary SW.		SW303	SR - 0212208E
Speaker		SP301	ZQ - B0950401
VR		VR301, SW301	RV - AB103A05
VR		VR302	RV - NA203B01
Lamp		PL301	ZP - A064101U
Lamp		PL301	ZP - A064102U
VR.		RV401	RW - VA050B01
Transistor	2N6094	Q108	QT - N6094XZM
"	2N6095	Q109	QT - N6095XZM
"	2N6096	Q110	QT - N6096XZM
"	2SC10964.L.L	Q214, Q215	QT - C1096XEA
"	2SA490	Q112	QT - A0490XBT
"	SR3AM-2	D401	QD - SSR3AM2E
RF Coil		RFC101	LC - AEX3620B
"		RFC102	LC - AEX3615B
"		RFC103	LC - AEX3615B
Cement R	18 $\Omega$ 5W	R138	RF - 05SK180N
"	" "	R139	RF - 05SK180N
Ceramic Cap	0.0047 $\mu$ F	C159	CK - DE472MDM
"	0.0022 $\mu$ "	C164	CH - CB222MYM
"	0.0022 $\mu$ "	C165	CH - CB222MYM
"	560p "	C166	CC - DE560KOM
"	0.0047 $\mu$ "	C205	CK - RB472PWM
"	0.01 $\mu$ "	C301	CK - RB103PZM
"	0.01 $\mu$ "	C302	CK - RB103PZM
"	0.01 $\mu$ "	C303	CK - RB103PZM
"	0.0022 $\mu$ "	C257	CK - RB222MWM
Jack		J301	YJ - Z04S002Z
DC Jack		J401	YJ - B02S001U
6P Jack		J402	YJ - S04S001Z
ANT Jack		J403	YJ - C02S002Z
Jack		J404	YJ - Z04S002Z
Lug Terminal		_____	YL - S03BXXZX
XTAL	T 156.300 MHz	ch06	XC - T1A4060T
"	R 156.300 "	ch06	XC - R1A4060T
"	T 156.800 "	ch16	XC - T1A4160T
"	R 156.800 "	ch16	XC - R1A4160T
"	T 157.100 "	ch22CG	XC - T1A4220T
"	R 161.700 "	ch22CG	XC - R1A4220T
"	T 157.300 "	ch26	XC - T1A4260T
"	R 161.900 "	ch26	XC - R1A4260T
"	T 157.400 "	ch28	XC - T1A4280T
"	R 162.000 "	ch28	XC - R1A4280T
"	T 156.425 "	ch68	XC - T1A4680T
"	R 156.425 "	ch68	XC - R1A4680T
"	T 156.525 "	ch70	XC - T1A4700T
"	R 156.525 "	ch70	XC - R1A4700T
XTAL	R 162.55 MHz	WX1	XC - R1A4WX1T
"	R 162.40 "	WX2	XC - R1A4WX2T
Escutcheon Assy		_____	AM - 1025**01



Description	Designation	Part #
L-angle	_____	ML - 861SZ007
Rear Panel	_____	MS - 867AM004
Cover	_____	MB - 886SM012
Front Panel	_____	MB - 862SZ030
Knob	_____	MN - 276AA059
"	_____	MN - 286AA042
Ser. No. Plate	_____	VV - S1025**2
L-Angle	_____	ML - 861SZ006
CH Plate	_____	VE - 50JAC003
Bracket	_____	MS - 426SZ004
Push Button	_____	VN - 221SB007
Escutcheon	_____	VE - 33JSW001
Bracket	_____	MX - 775SZ002
Heat Sink	_____	ML - 342AQ002
"	_____	ML - 474AD001
Bracket	_____	MU - 621SZ001
"	_____	MU - 621SZ002
Sponge	_____	VQ - 621MY001
"	_____	VQ - 621MY002
Stud	_____	MT - 313BD002
Heat Sink	_____	MK - 664AX001
Bushing	_____	VM - 166RB001
Screw	_____	VN - 163XX001
Shield	_____	MX - 121SV001
Himelon	_____	VS - 707YB001
Holder	_____	VM - 165RX001
Sheet	_____	VS - 653YB001
CEMS Screw	_____	BS - PC3006NZ
CEMS Screw	_____	BS - PC4012NZ
Bras Tap Screw	_____	BT - PW3008BZ
Bind HD Screw	_____	BS - PB3006NN
Bind HD Screw	_____	BS - PB3008NB
"	_____	BS - PB3008NN
Flat HD Screw	_____	BS - PS3006NN
Flat HD Screw	_____	BT - PS2005BN
Bind HD Screw	_____	BS - PB2608NB
"	_____	BS - PB2608NN
Bind HD Screw	_____	BS - PB2610NN
"	_____	BS - PB3006NB
I.T. Lock Washer	_____	BW - U30655SW
Flat L Washer	_____	BW - M30705SN
Flat L Washer	_____	BW - M26705SN
Hexa Nut	_____	BN - HCL30NBN
"	_____	BN - HCL26NSN
GND Washer	_____	BW - T30602BN
"	_____	BW - T26602BN
Inst Manual	_____	KT - 1025**AX





Description			Designation	Part #
CH Sticker			_____	KL -- 000040XX
FCC	Form 502		_____	KZ -- 000003AX
"	" 753A		_____	KC -- 000023XX
"	SS bulletin		_____	KZ -- 000014XX
FCC-76K Card			_____	KZ -- 000006CX
LOGO Card			_____	KC -- 000027XX
Warranty Card			_____	KW -- 000024XX
Weather Label			_____	KL -- 000045XX
DC Cord Assy			_____	AC -- DC010GEA
Bracket			_____	MU -- 863SM003
Holder			_____	MZ -- 331SZ002
Screw			_____	MF -- 284SN001
Washer			_____	VS -- 706RB001
Truss Tap Screw			_____	BT -- PT5013AN
Pan Tap Screw			_____	BT -- PP4010BN
I. T Lock Washer			_____	BW -- U40855SW
O. T Lock Washer			_____	BW -- G50A06SW
Microphone			_____	ZG -- AAZ50131
Escutcheon			_____	VE -- 86JSM002
Badge			_____	ME -- 41PAA006
Indicator			_____	VF -- 176SN001
"			_____	VF -- 153AR001
Transistor	2SC839 N	Q101		QT -- C0839XBA
"	2SC900 U	Q102		QT -- C0900XCA
"	2SC839 H	Q103		QT -- C0839XBA
"	2SC815 KL	Q104		QT -- C0815XBA
"	2SC784 DN	Q105		QT -- C0784XAT
"	2SC387 A	Q106		QT -- C0387AZT
"	2SC387 A	Q107		QT -- C0387AZT
"	2SC734 GR	Q111		QT -- C0734XAT
"	2SD235	Q113		QT -- D0235XAT
"	2SC496	Q114		QT -- C0496XAT
"	2SC496	Q115		QT -- A0496XZT
I. C.	TA7063 P	IC101		QQ -- M07063AT
"	TA7062 P	IC102		QQ -- M07062AT
P. W. Board				PT -- TX008EOX
Vari-Cap. Diode	1S2688D	D101		QD -- CS2688DJ
Sl. Diode	1S1555	D102		QD -- SS1555XT
" "	"	D103		" "
Sl. Diode	MI301	D104		QD -- SM1301XE
" "	"	D105		" "
" "	1S1555	D106		QD -- SS1555XT
" "	MI301	D108		QD -- SM1301XE
" "	"	D109		" "
" "	1S1555	D110		QD -- SS1555XT
Zenner Diode	BZ1000	D111		QD -- ZBZ100XJ
Sl. Diode	F14A	D112		QD -- SF14AXXA
" "	"	D113		" "
Varistor	SV04	D114		QV -- FSV04XXD
Sl. Diode	F14A	D115		QD -- SF14AXXA
Vari-Cap. Diode	1S2688D	D117		QD -- CS2688DJ
Sl. Diode	1S1555	D118		QD -- SS1555XT



Description		Designation	Part #
RF Coil		L101	TR - 10GB001S
" "		L102	TR - 10GR002S
" "		L103	TR - 10GC001S
" "		L104	TR - 10GM001S
" "		L105	TR - 10GE002S
" "		L106	TR - 10GM002S
" "		L107	TR - 10GZ003S
" "		L108	TR - 13GM001S
RF Coil		L109	LA - 1EG0701A
" "		L110	LD - ADD3604R
" "		L111	LA - 1GG0702A
" "		L112	LA - 1MG0701A
" "		L113	LA - 1GJ0702A
" "		L114	LA - 1GJ0701A
" "		L115	LA - 1GG0703A
" "		L116	LD - ADD3604R
" "		L117	LA - 1GG0702A
" "		L118	" "
" "		L119	LA - 1GG0703A
RF Coil		RFC104	LM - BDD2005D
" "		RFC105	LM - BDD2005E
Ceramic Cap	360pF	C101 - 112	CC - RB360KPM
" "	2200p "	C113	CC - DB221KPM
" "	0.01μ "	C114	CK - RB103PZM
" "	56p "	C115	CC - DB560KPM
" "	10p "	C116	CC - CB100DPM
" "	0.01μ "	C117	CK - RB103PZM
" "	1000p "	C118	CK - RB102MWM
" "	3300p "	C119	CK - RB332MWM
" "	0.05μ "	C120	CB - D1B503MM
" "	0.01μ "	C121	CK - RB103PZM
" "	0.01μ "	C122	" "
" "	10p "	C123	CC - DB101KPM
" "	0.01μ "	C124	CK - RB103PZM
" "	0.01μ "	C125	" "
" "	0.01μ "	C126	" "
" "	0.0033μ "	C127	CK - RB332MWM
" "	2p "	C128	CC - DB020COM
" "	56p "	C129	CC - DB560KPM
" "	82p "	C130	CC - DB820KPM
" "	0.01μ "	C131	CK - RB103PZM
ELYT. Cap	10p "	C132	CE - AD100ALN
Ceramic Cap	0.01μ "	C133	CK - RB103PZM
" "	1p "	C134	CC - DB010CPM
" "	22p "	C135	CC - DB220KPM
" "	47p "	C136	CC - DB470KPM
" "	0.01μ "	C137	CK - RB103PZM
" "	0.01μ "	C138	" "
" "	0.001μ "	C139	CK - RB102MWM
" "	0.0033μ "	C140	CK - RB332MWM
" "	8p "	C141	CC - DB080CPM
" "	39p "	C142	CC - DE390KCM
" "	0.01μ "	C143	CK - RB103PZM
" "	15p "	C144	CC - DE150KCM
" "	3p "	C145	CC - DB030CPM
" "	39p "	C146	CC - DE390KCM
" "	0.001μ "	C147	CK - RB102MWM
" "	0.0033μ "	C148	CK - RB332MWM
" "	0.01μ "	C149	CK - RB103PZM
" "	15p "	C150	CC - DE150KCM
" "	39p "	C151	CC - DE390KCM
" "	0.001μ "	C152	CK - RB102MWM





Description			Designation	Part #
Ceramic Cap	27pF		C153	CC — DE270KCM
" "	10p "		C154	CC — DE100DCM
" "	12p "		C155	CC — DE120KCM
" "	0.01μ "		C156	CK — RB103PZM
" "	0.01μF		C157	CK — RB103PZM
ELYT. Cap	10p "		C158	CE — AD100ALN
Ceramic Cap	0.0047μ "		C159	CK — DE472MDM
" "	0.01μ "		C160	CK — RB103PZM
" "	0.01μ "		C161	" "
" "	0.0047μ "		C162	CK — DE472MDM
" "	0.0047μ "		C163	" "
" "	4p "		C167	CC — DB040CPM
" "	0.001μ "		C168	CK — RB102MWM
" "	15p "		C169	CC — DE150KCM
" "	22p "		C170	CC — DE220KCM
" "	6p "		C171	CC — DB060CPM
" "	0.0047μ "		C172	CK — DE472MDM
" "	15p "		C173	CC — DE150KCM
" "	8p "		C174	CC — DB080CPM
" "	0.001μ "		C175	CK — RB102MWM
" "	0.001μ "		C176	" "
" "	0.001μ "		C177	" "
Tantalum Cap	0.47μF	35V	C178	CS — SFR47MDC
Ceramic Cap	15p "		C179	CC — DB151KOM
ELYT. Cap	33p "		C180	CE — AC330ALN
Ceramic Cap	0.2μ "		C181	CB — D1B204MM
" "	0.05μ "		C182	CB — D1B503MM
ELYT. Cap	10p "		C183	CE — AE100ALN
Ceramic Cap	0.001μ "		C184	CK — RB102MWM
" "	0.0033μ "		C185	CK — RB332MWM
" "	0.3μ "		C186	CB — D1B304MM
" "	0.05μ "		C187	CB — D1B503MM
" "	0.05μ "		C188	CB — D1B503MM
" "	0.05μ "		C189	CB — D1B503MM
ELYT. Cap	1p "		C190	CE — AG010ALN
Ceramic Cap	0.01μ "		C191	CK — RB103PZM
ELYT. Cap	10p "		C192	CE — AD100ALN
" "	47p "		C193	CE — AC470ALN
" "	100p "		C194	CE — AB101ALN
" "			C195	CE — AE4R7ALN
Ceramic Cap	0.01μF		C196	CK — RB103PZM
" "	0.001μ "		C197	CK — RB102MWM
" "	0.001μ "		C198	" "
" "	0.0033μ "		C199	CK — RB332MWM
" "	0.0033μ "		C200	" "
" "	0.001μ "		C501	CK — RB102MWM
Trimmer Cap	20pF		CT101 —112	CT — Z7200K01
" "	20p "		CT113	" "
" "	10p "		CT114	CT — Z7100K01
" "	20p "		CT115	CT — Z7200K01
" "	20p "		CT116	CT — EA200K01
Carbon R	15k Ω		R101	RD — 14VJ153N
" "	15k "		R102	" "
" "	1.8k "		R103	" — 14VJ182N
" "	100 "		R104	" — 14VJ101N
" "	47 "		R105	" — 14VJ470N
" "	47 "		R106	" "
" "	47 "		R107	" "
" "	1k "		R108	" — 14VJ102N
" "	10k "		R109	" — 14VJ103N
" "	3.3k "		R110	" — 14VJ332N
" "	10k "		R111	" — 14VJ103N
" "	680k "		R112	" — 14VJ681N



Description		Designation	Part #
Carbon R	68Ω	R113	RD — 14VJ680N
"	15k "	R114	" — 14VJ153N
"	4.7k "	R115	" — 14VJ472N
"	470 "	R116	" — 14VJ471N
"	68 Ω	R117	" — 14VJ680N
"	2.2k "	R118	" — 14VJ222N
"	33k "	R119	" — 14VJ333N
"	150 "	R120	" — 14VJ151N
"	68 "	R121	" — 14VJ680N
"	1k "	R122	" — 14VJ102N
"	47 "	R123	" — 14VJ470N
"	220 "	R124	" — 14VJ221N
"	10 "	R125	" — 14VJ100N
Solid R	47 "	R127	RC — 14GK470N
"	68k "	R130	" — 14GK683N
"	68 "	R132	" — 14GK680N
"	100k "	R133	" — 18GK104N
"	10k "	R134	" — 18GK103N
"	100k "	R135	" — 18GK104N
M-Oxide Film R	82 "	R136	RG — 2ANJ820N
Solid R	1k "	R137	RC — 12GK102N
"	220 "	R140	" — 12GK221N
"	680 "	R141	" — 12GK681N
Carbon R	3.3k "	R142	RD — 14VJ332N
"	22k "	R143	" — 14VJ223N
"	1k "	R144	" — 14VJ102N
"	2.2k "	R145	" — 14VJ222N
"	4.7k "	R146	" — 14VJ472N
"	39k "	R147	" — 14VJ393N
"	150k "	R148	" — 14VJ154N
"	220k "	R149	" — 14VJ224N
"	560 "	R150	" — 14VJ561N
"	6.8k "	R151	" — 14VJ682N
"	3.3k "	R153	" — 14VJ332N
"	3.3k "	R154	" "
"	3.3k "	R155	" "
Solid R	560 "	R156	RC — 12GK561N
"	150 "	R157	" — 12GK151N
"	680 "	R158	" — 14GK681N
"	100 "	R161	" — 14GK101N
Sub-Mini. VR.	10k "	R152	RP — JNB10301
" "	20k "	R166	" — DNB20301
XTAL Socket		_____	YS — X120001Z
Terminal		_____	MX — 316BS001
"		_____	VT — 220SX001
Tim Point		_____	YZ — F1200001
Shield		_____	MU — 361SX001
"		_____	MS — 535SV001
Ceramic Cap	10pF	_____	CC — TB100DPT
" "	5 "	_____	CC — TB050DPT
Solid R		R126	RC — 12GK331N
"		R128	" "
"		R129	" — 12GK100N
"		R131	" — 12GK6R8N
Transistor	3SK40 L	Q201	QT — L0040XAA
"	2SK23A 540	Q202	" — K0023AAS
"	2SC839 H	Q203	" — C0839XBA
"	"	Q204	" "
"	2SC387 A	Q205	" — C0387AZT
"	2SK23A 540	Q206	" — K0023AAS





Description		Designation	Part #
Transistor	2SC839 H	Q207	QT — C0839XBA
"	2SC900 F	Q208	" — C0900XBA
"	"	Q209	" "
"	"	Q210	" "
"	2SC900 F	Q211	" — C0900XBA
"	"	Q212	" "
"	2SC945 Q	Q213	" — C0945XBA
I. C.	TA7061AP	IC201	QQ — M07061AT
"	TA7060P	IC202	" — M07060AT
"	TA7062P	IC203	" — M07062AT
P. W. Board			PT — RX00BA0X
Sl. Diode	1S1355	D201	QD — SS1555XT
GE. Diode	1N60	D202	QD — GIN60XXT
"	"	D203	" "
"	1S34	D204	" — G1S34XXT
"	"	D205	" "
Sl. Diode	1S1555	D206	" — SS1555XT
Ceramic Filter	CFM-455E	FL201	FB — R455F03M
"	CFU-455B	FL202	" — R455F02M
"	SFD-455	FD201	FZ — R455A01M
XTAL Oscillator	11.245 MHz	X201	XA — Z1A5002T
Thermistor	19D 47FH	TH201, 202	QH — C19D47BJ
RF Coil	0.63 $\mu$ H	CH201	LF — R63MA01S
" "	680 $\mu$ "	CH202	" — 681KA01S
" "	680 $\mu$ "	CH203	" — 681KA01S
" "	2m "	CH204	" — 202KB01S
" "	5.6m "	CH205	" — 562KB01S
" "	100m "	CH206	" — 104JB01S
" "	30.338B	CH401	LJ — 129B001W
Trimmer Cap	20pF	CT201 — 214	CT — Z7200K01
Solid R	10k $\Omega$	R201	RC — 14GK103N
"	47k "	R202	" — 14GK473N
"	47k "	R203	" — 14GK473N
"	330 "	R204	" — 14GK331N
"	10 "	R205	" — 14GK100N
"	150 "	R206	" — 14GK151N
"	150 "	R207	" "
Carbon R	15k "	R208	RD — 14VJ153N
"	15k "	R209	" "
"	2.2k "	R210	" — 14VJ222N
"	150 "	R211	" — 14VJ151N
Solid R	22 "	R212	RC — 14GK220N
Carbon R	4.7k "	R213	RD — 14VJ472N
"	47k "	R214	" — 14VJ473N
Olid R	150 "	R215	RC — 14GK151N
"	3.3k "	R216	" — 14GK332N
"	47k "	R217	" — 14GK473N
"	150 "	R218	" — 14GK151N
Carbon R	4.7k "	R219	RD — 14VJ472N
Solid R	220 "	R220	RC — 14GK221N
Carbon R	15k "	R221	RD — 14VJ153N
"	15k "	R222	" "
"	2.2k "	R223	" — 14VJ222N
"	330 "	R224	" — 14VJ331N
"	100 "	R225	" — 14VJ101N
"	1.5k "	R226	" — 14VJ152N



Description		Designation	Part #
Carbon R	100Ω	R227	RD - 14VJ101N
Solid R	1k "	R228	RC - 14GK102N
Carbon R	4.7k "	R229	RD - 14VJ472N
Solid R	1.2k "	R230	RC - 14GK122N
Carbon R	100 "	R231	RD - 14VJ101N
"	220 "	R232	" - 14VJ221N
"	150 "	R233	" - 14VJ151N
"	5.6k "	R234	" - 14VJ562N
"	5.6k "	R235	" - 14VJ562N
"	5.6k "	R236	" "
"	4.7k "	R237	" - 14VJ472N
"	27k "	R238	" - 14VJ273N
"	68k "	R239	" - 14VJ683N
"	100 "	R240	" - 14VJ101N
"	1k "	R241	" - 14VJ102N
"	3.3k "	R242	" - 14VJ332N
"	100k "	R243	" - 14VJ104N
"	100k "	R244	" "
"	1.5k "	R245	" - 14VJ152N
Sub-Mini VR.	EVT-T5AA00B52	R246	RP - DNB50102
Carbon R	56k Ω	R247	RD - 14VJ563N
"	6.8k "	R248	" - 14VJ602N
"	1k "	R249	" - 14VJ102N
"	2.2k "	R250	" - 14VJ222N
"	1.5k "	R251	" - 14VJ152N
"	2.2k "	R252	" - 14VJ222N
"	470k "	R253	" - 14VJ474N
"	1.5k "	R254	" - 14VJ152N
"	22k "	R255	" - 14VJ223N
"	1k "	R256	" - 14VJ102N
"	4.7k "	R257	" - 14VJ472N
Solid R	220k "	R258	RC - 12GK221N
Carbon R	39 "	R259	RD - 14VJ390N
Solid R	220 "	R260	RC - 12GK221N
Carbon R	39 "	R261	RD - 14VJ390N
Solid R	2.7k "	R262	RC - 14GK272N
"	220 "	R263	" - 12GK221N
Carbon R	4.7 "	R264, 265	RX - 1ANJR47N
"	2.2k "	R210	RD - 14VJ102N
"	68 "	R205	RC - 14GK680N
CR Module	B2QP103Z222K	CR201	CR - A103A06K
"	B2QP103Z331K	CR202	" - A103A05K
"	"	CR203	" "
"	B2QP103Z102K	CR204	" - A103A01K
Styroflex Cap	150pF	C207	CQ - SC151JEN
"	470p "	C208	" - SC471JEN
Ceramic Cap	100p "	C209	CC - DB101KOM
Ceramic Cap	33p "	C201	CC - RB330KPM
" " "	0.01μ "	C204	CK - DB103MYM
Ceramic Cap	0.01μ "	C206	CK - DB103MYM
" "	56p "	C207	CC - DB560KPM
" "	220p "	C208	" - RB221KUM
" "	47p "	C209	" - RB470KPM
" "	0.01μ "	C210	CK - DB103MYM
" "	22p "	C211	CC - RB220KPM
" "	0.01μ "	C212	CK - DB103MYM
" "	1p "	C213	CC - DB010CCM
" "	15p "	C214	" - RB150KPM
" "	68p "	C215	" - RB680KUM
" "	0.0047μ "	C216	CK - RB472PWW
" "	0.0047μ "	C217	" - RB472PWW





Description		Designation	Part #
Ceramic Cap	0.1 $\mu$ F	C218	CB — D1B104MM
" "	1p "	C219	CC — DB010CCM
" "	0.01 $\mu$ "	C220	CK — RB103PZM
" "	2p "	C221	CC — DB020CCM
" "	2p "	C222	CC — DB020CCM
" "	1p "	C223	" — DB010CCM
" "	2p "	C224	CC — DB020CCM
Styroflex Cap	0.0015 $\mu$ "	C225	CQ — SC152JEN
Ceramic Cap	0.1 $\mu$ "	C226	CB — D1B104MM
" "	1.0 $\mu$ "	C227	" "
ELYT. Cap	10p "	C228	CE — AD100ALN
Ceramic Cap	22p "	C229	CC — DB220KCM
" "	220p "	C230	" — RB221KUM
" "	0.1 $\mu$ "	C231	CB — D1B104MM
" "	1p "	C232	CC — DB010CCM
" "	0.1 $\mu$ "	C233	CB — D1B104MM
Film Cap	0.22 $\mu$ "	C234	CQ — ZB224JEE
Ceramic Cap	0.1 $\mu$ "	C235	CB — D1B104MM
" "	0.1 $\mu$ "	C236	" "
" "	0.1 $\mu$ "	C237	" "
" "	0.01 $\mu$ "	C238	CK — RB103PZM
" "	68p "	C239	CC — RB680KUM
" "	0.1 $\mu$ "	C240	CB — D1B104MM
" "	0.1 $\mu$ "	C241	" "
" "	0.1 $\mu$ "	C242	" "
" "	0.1 $\mu$ "	C244	" "
" "	0.1 $\mu$ "	C245	" "
" "	1p "	C249	CC — DB510KCM
" "	0.0022 $\mu$ "	C250	CK — RB222MWM
ELYT. Cap	4.7 $\mu$ "	C251	CE — AD4R7NLN
" "	4.7 $\mu$ "	C252	CE — AD4R7ALN
Ceramic Cap	0.05 $\mu$ "	C253	CB — D1B503MM
" "	0.1 $\mu$ "	C254	" — D1B104MM
ELYT. Cap	4.7 $\mu$ "	C255	CE — AD4R7ALN
Ceramic Cap	0.0022 $\mu$ "	C256	CK — RB222MWM
" "	0.0022 $\mu$ "	C257	" "
" "	68p "	C258	CC — DB680KWM
" "	0.3 $\mu$ "	C259	CB — D1B304MM
Mylar Cap	0.0047 $\mu$ "	C260	CQ — MB472KEH
ELYT. Cap	10p "	C261	CE — AD100ALN
Ceramic Cap	0.1 $\mu$ "	C262	CB — D1B104MM
ELYT. Cap	10p "	C263	CE — AD100ALN
" "	4.7 $\mu$ "	C264	" — AD4R7ALN
Ceramic Cap	0.01 $\mu$ "	C265	CK — RB103PZM
ELYT. Cap	100p "	C266	CE — AD101ALN
Ceramic Cap	0.022 $\mu$ "	C267	CB — D1E223MM
" "	0.022 $\mu$ "	C268	" — D1E223MM
ELYT. Cap	100 $\mu$ "	C269	CE — AD101ALN
" "	100 $\mu$ "	C270	" "
Ceramic Cap	0.1 $\mu$ "	C271	CB — D1B104MM
ELYT. Cap	100 $\mu$ "	C272	CE — AD101ALN
Ceramic Cap	33p "	C273 — 286	CC — RB330KPM
Mylar Cap	0.22 $\mu$ "	C287	CQ — MB223KEH
ELYT. Cap	0.0001 $\mu$ "	C401	CE — AD102ALN
Ceramic Cap	0.0047 $\mu$ "	C246	CK — RB472MWM
" "	0.0047 $\mu$ "	C202, 203	CH — XB472KFT
" "	22p "	C273 — 286	CC — RB220KPM
Terminal		_____	VT — 220SX001
"		_____	MX — 316BS001
XTAL Socket		_____	YS — X010001Z
"		_____	" — X120001Z
Shield		_____	MU — 532SV001
"		_____	" — 521SV001

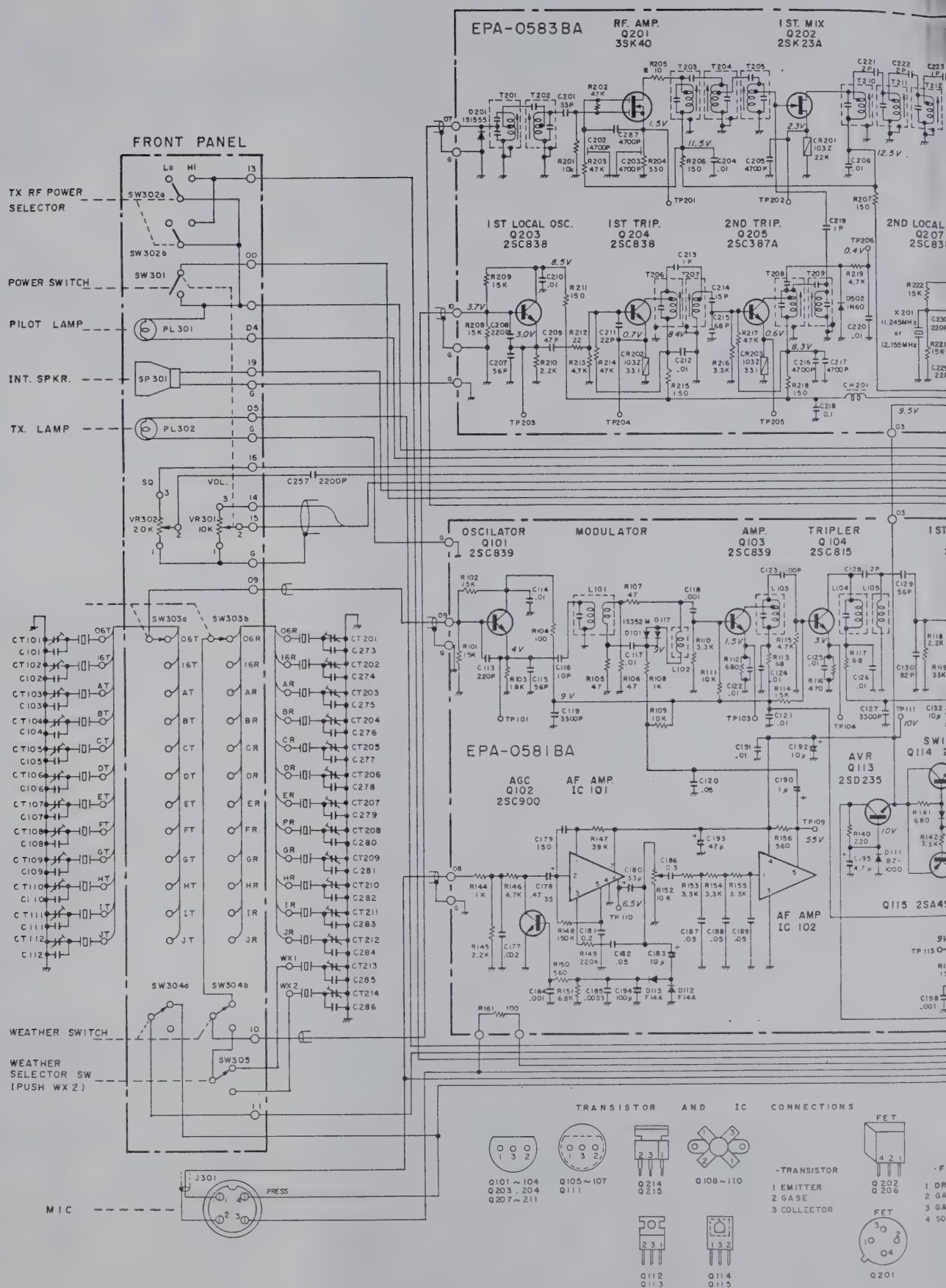


Description				Designation	Part #
Shield				_____	MS — 635SX001
"				_____	" — 635SX002
"				_____	MU — 363SX001
Ceramic Cap	0.0047 $\mu$ F			C288	CK — DB472PEM
" "	10p "			C601	CC — TB100DPT
" "	33p "			C602	" — TB330KPT
" "	1p "			C603	" — TB010DOT
" "	3p "			C604	" — TB030DOT
" "	8p "			C605	" — TB080DPT
" "	5p "			C606	" — TB0R5COT
" "	8p "			C607	" — TB080DPT
" "	5p "			C608	" — TB0R5COT
" "	7p "			C609	" — TB070DPT
" "	8p "			C610	" — TB080DPT
" "	2p "			C611	" — TB020DOT
" "	1p "			C612	" — TB010DOT
" "	10p "			C613	" — TB100DPT
RF Coil				T201	TR — 13GJ001S
" "				T202	" — 13GM003S
" "				T203	" — 13GM005S
" "				T204	" — 13GM007S
" "				T205	" — 13GM009S
" "				T206	" — 10GM004S
" "				T207	" — 10GZ006S
" "				T208	" — 13GM011S
" "				T209	" — 13GM013S
I. F. T.				T210 — 214	" — 10MF001S
"				T215	" — 10LB001S
"				T216	" — 07LA014S
AF I. P. T.				T218	TA — G20A006Y





## SCHEMATIC DIAGRAM

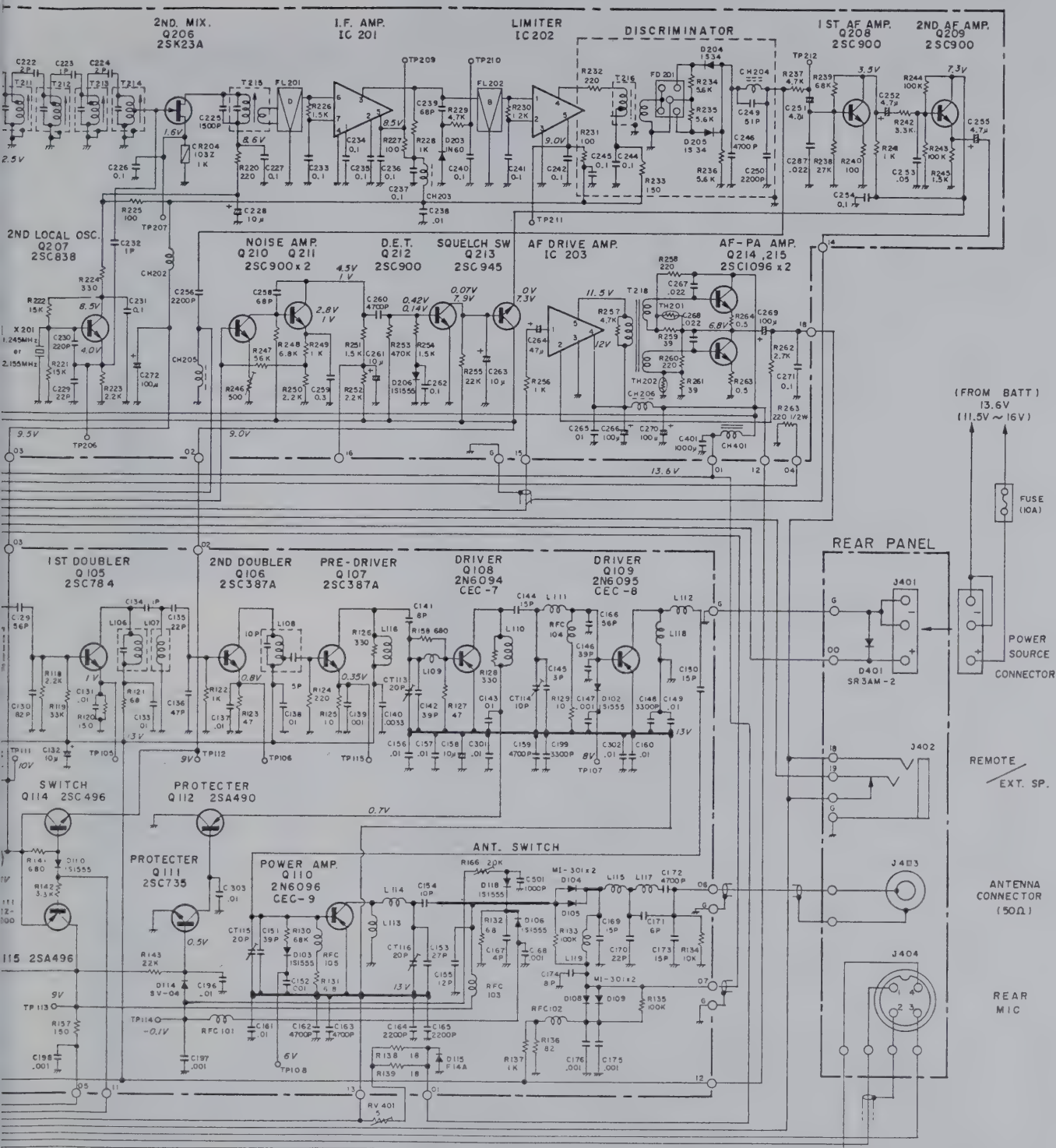












#### NOTE ON VOLTAGE CHECK

1. WHEN MEASURING VOLTAGES AT FOLLOWING TEST POINTS. CONNECT MINUS TESTER LEAD TO COMMON CHASSIS AND PLUS LEAD TO EACH TEST POINT TO BE MEASURED. TP101, TP103, TP104, TP105, TP106, TP110, TP112, TP113, TP201 through TP211
2. WHEN MEASURING VOLTAGES AT TP107 AND TP108. CONNECT TESTER'S MINUS LEAD TO +13.6V LINE AND PLUS LEAD TO EACH TEST POINT.
3. WHEN MEASURING VOLTAGES AT TP114, CONNECT TESTER'S PLUS LEAD TO COMMON CHASSIS AND MINUS LEAD TO TEST POINT. VOLTAGES IN PARENTHESES ARE MEASURED WITH SQUELCH CIRCUIT IN OFF CONDITION.

-FET



IC 101  
IC 201



IC 102  
IC 202  
IC 203

- 1 DRAIN
- 2 GATE 1
- 3 GATE 2
- 4 SOURCE



- 32 -





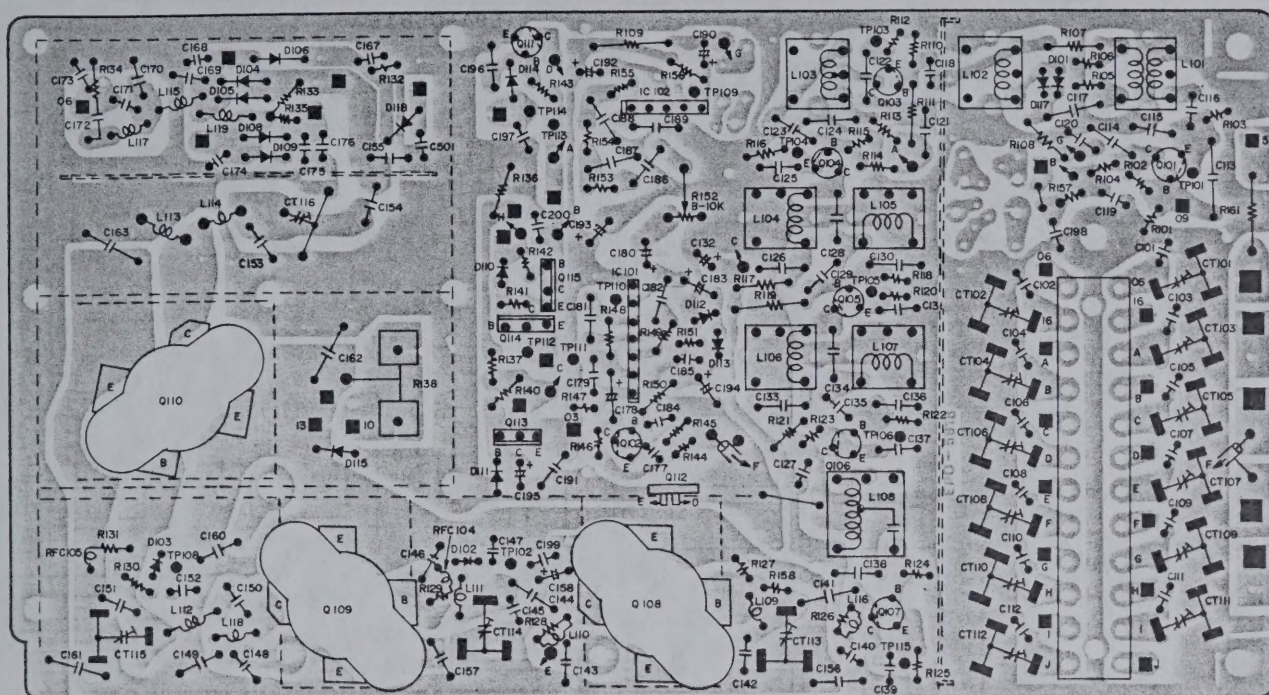
— 33 —



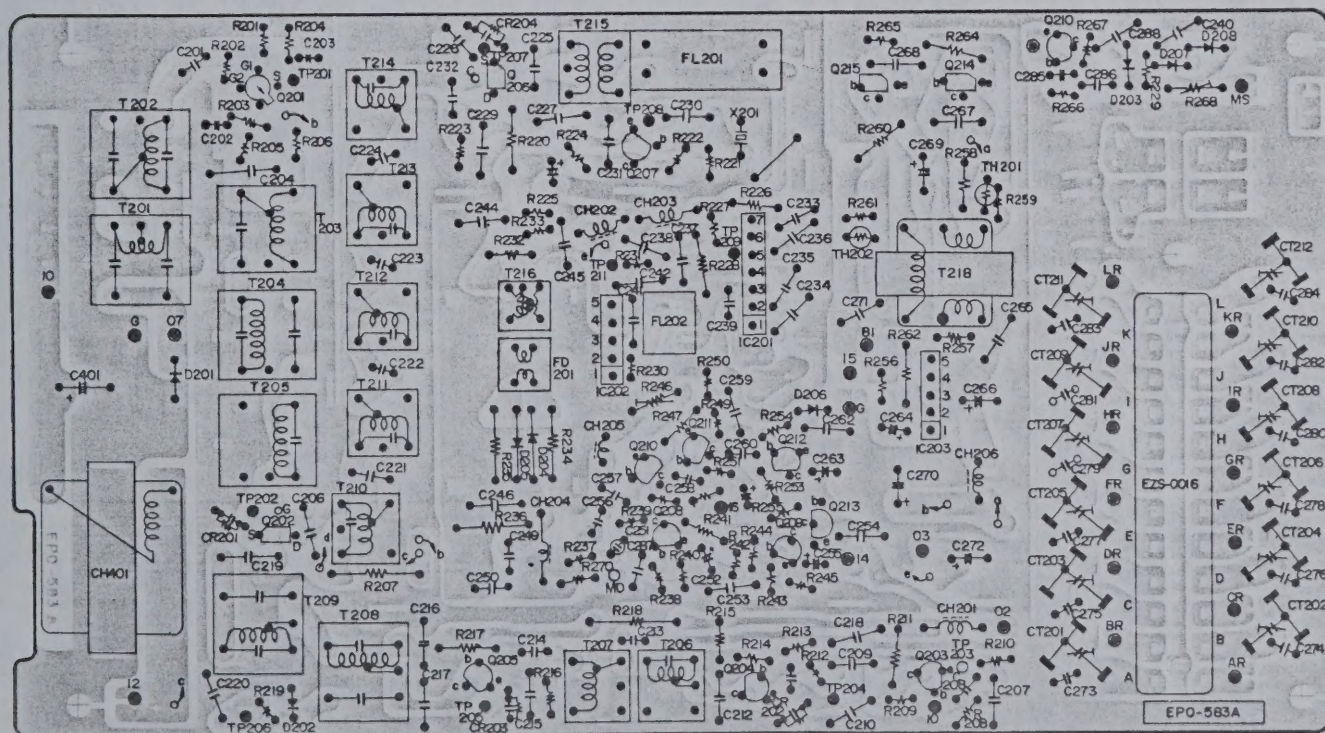




# PRINTED CIRCUIT BOARD PARTS LOCATION DIAGRAM (2)



TRANSMITTER SECTION  
VIEW FROM PATTERN SIDE



RECEIVER SECTION  
VIEW FROM PATTERN SIDE



